

**Regulations and Curricula
for
Post Graduate Degree and Diploma Courses
in
Medical Sciences
2000**

**Volume III
Clinical Subjects
(Consolidated)**



**Rajiv Gandhi University of Health Sciences, Karnataka
4th 'T' Block, Jayanagar, Bangalore-560 041**

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COMPLEMENTARY COPY

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Regulations and Curricula for Post Graduate Degree and Diploma Courses in
Medical Sciences-2000

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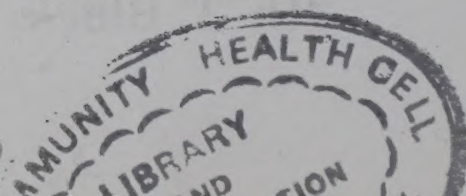
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Regulations for Post Graduate Degree and Diploma Courses in Medical Sciences

(Annexure to University Notification No. UA/ORD-6/99-2000 dated 01.01.2000)

Volume III Clinical Subjects

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Ref : No. UA/ORD-6/1999-2000

Date : 01.01.2000

NOTIFICATION

Sub : Revised ordinances pertaining to Post Graduate Degree,
Diploma & Super Speciality Courses in Medicine.

Ref : Minutes of the 16th Syndicate Meeting held on 16.11.1999.

In exercise of the powers conferred under Sec. 35(2) of the RGUHS Act, the Syndicate at its Meeting held on 16.11.1999 has been pleased to approve the Revised Ordinances pertaining to Post Graduate Degree, Diploma & Super Speciality Courses in Medicine as given in schedule here to annexed.

The Revised Ordinances as above shall come into force immediately and is applicable for University examination of March 2000 and onwards.

By Order,

Registrar

To

1. The Principals of all Medical Colleges affiliated to RGUHS.
2. All the Members of the Syndicate / Senate / Academic Council.

Copy to :-

1. Secretary to Governor, Raj Bhavan, Bangalore-560 001.
2. Secretary to Government, Medical Education, Health & Family Welfare Department, 3rd Stage, M.S. Building, Dr. B.R. Ambedkar Veedhi, Bangalore-560 001.
3. Registrar (Eva) / Finance Officer / Consultant, CDC / Consultant, Computer Centre / PRO, RGUHS
4. All officers in the University / Examination Branch / Academic Branch.
5. PS to Vice-Chancellor / Registrar / OC.

Rajiv Gandhi University of Health Sciences, Karnataka

4th T Block, Jayanagar, Bangalore - 560 041

No. UA/ORD-06/1999-2000

26.12.2000

NOTIFICATION

Sub: Revised Ordinance pertaining to PG Degree, Diploma and Super Speciality Courses in Medicine

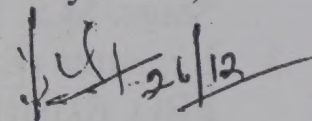
Read: The Revised Ordinance along with Syllabus and Scheme of Examination of Pre-clinical and Para-clinical subjects pertaining to Postgraduate Degree, Diploma and Super Speciality courses in Medicine as approved by the Syndicate at its meeting held on 16.11.1999 and notified in the University notification No. UA/ORD-6/1999-2000 dt. 01.01.2000. Now the Syndicate at its meeting held on 22.11.2000 has approved Syllabus of Postgraduate Clinical Subjects and the same is notified.

In exercise of the powers conferred under Sec. 35(2) of the RGUHS Act, the Syndicate has been pleased to approve the Curriculum (Syllabus) of following PG Clinical Subjects in respect of above ordinance as given in the schedule here to annexed.

Subject	Degree	Diploma
Anesthesiology	1. M.D.	2. D.A.
Aviation Medicine	3. M.D.	---
Dermatology, Venereology and Leprosy	4. M.D.	5. DDVL
General Medicine	6. M.D.	----
General Surgery	7. M.S.	----
Obstetrics & Gynecology	8. M.S.	9. DGO
Oto-Rhino-Laryngology	10. M.S.	11. DLO
Ophthalmology	12. M.S.	13. DO
Orthopedics	14. M.S.	15. D. Ortho
Pediatrics	16. M.D.	17. DCH
Psychiatry	18. M.D.	19. DPM
Radio-Diagnosis	20. M.D.	21. DMRD
Radiotherapy	22. M.D.	23. DMRT
Tuberculosis & Respiratory Medicine	24. M.D.	25. DTCD

The Syllabus as above shall be applicable from the Academic Year 2000-01.

By order,



REGISTRAR

To

1. The Principals of all Medical Colleges affiliated to RGUHS.
2. The Members of the Syndicate / Senate / Academic Council.

Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore

Chapter I

Regulations for Post Graduate Degree and Diploma Courses in Medical Sciences

1. Branches of Study

1.1 Postgraduate Degree Courses

The following courses of studies may be pursued.

A. *M.D. (Doctor of Medicine)*

1. Anaesthesiology
2. Aviation Medicine
3. Anatomy
4. Biochemistry
5. Community Medicine
6. Dermatology, Venereology and Leprosy
7. Forensic Medicine
8. General Medicine
9. Microbiology
10. Pathology
11. Paediatrics
12. Pharmacology
13. Physiology
14. Psychiatry
15. Radio-diagnosis
16. Radio-threapy
17. Tuberculosis & Respiratory Medicine

and such other subjects as might have been introduced by the Universities in Karnataka prior to commencement of Health University i.e., 1.6.1996, or recognised by Medical Council of India.

B. *M.S. (Master of Surgery)*

1. General Surgery
2. Obstetrics and Gynecology

3. Ophthalmology
4. Orthopedics
5. Oto-Rhino-Laryngology

and such other subjects as might have been introduced by the Universities in Karnataka prior to commencement of Health University i.e., 1.6.1996, or recognised by Medical Council of India.

C. D.M. (Doctor of Medicine)

1. Cardiology and such subjects recognised by Medical Council of India.

D. M.Ch (Master of Chirurgie)

In the subjects recognised by Medical Council of India.

1.2 Postgraduate Diploma Courses

Post graduate diploma course may be pursued in the following subjects:

Child Health (D.C.H.), Obstetrics and Gynaecology (D.G.O.), Otorhinolaryngology (D.L.O.), Ophthalmology (D.O.), Orthopaedics (D.Ortho), Anaesthesiology (D.A.), Clinical Pathology (D.C.P.), Microbiology (D. Micro), Public Health (D.P.H), Forensic Medicine (D.F.M.), Dermatology, Venerology and Leprosy (D.D.V.L.), Psychiatry (D.P.M.), Radio-Diagnosis (DMRD), Radio-therapy (DMRT), Tuberculosis and Chest Diseases (D.T.C.D.) and such other subjects as might have been introduced by the Universities in Karnataka prior to commencement of Health University i.e., 1-6-1996, and recognised by Medical Council of India.

2. Eligibility for Admission

2.1 MD / MS Degree and Diploma Courses: A candidate affiliated to this university and who has passed final year M.B.B.S. examination after pursuing a study in a medical college recognised by the Medical Council of India, from a recognised Medical College affiliated to any other University recognised as equivalent thereto, and has completed one year compulsory rotating internship in a teaching Institution or other Institution recognised by the Medical Council of India, and has obtained permanent registration of any State Medical Council shall be eligible for admission.

2.2 D.M and M.Ch Courses:

D.M.: Candidate seeking admission for D.M courses in any subject must possess recognised degree of MD (or its equivalent recognised degree) in the subject specified in the regulations of the Medical Council of India from time to time.

M.Ch : Candidate seeking admission for M.Ch course in any subject must possess recognised degree of MS (or its equivalent recognised degree) in the subject specified in the regulations of the Medical Council of India from time to time.

3. Obtaining Eligibility Certificate by the University before making Admission

No candidate shall be admitted for any postgraduate degree/diploma course unless the candidate has obtained and produced the eligibility certificate issued by the University. The candidate has to make an application to the University with the following documents along with the prescribed fee :

1. MBBS pass / degree certificate issued by the University.
2. Marks cards of all the university examinations passed MBBS course.
3. Attempt Certificate issued by the Principal.
4. Certificate regarding the recognition of the medical college by the Medical Council of India.
5. Completion of internship certificate.
6. In case internship was done in a non-teaching hospital, a certificate from the Medical Council of India that the hospital has been recognised for internship.
7. Registration by any State Medical Council and
8. Proof of SC/ ST or Category I, as the case may be.

Candidates should obtain the Eligibility Certificate before the last date for admission as notified by the University.

A candidate who has been admitted to postgraduate course should register his / her name in the University within a month of admission after paying the registration fee.

4. Intake of Students

The intake of students to each course shall be in accordance with the ordinance in this behalf.

5. Course of Study

5.1 Duration

a) *M.D /M.S Degree Courses*

The course of study shall be for a period of 3 years consisting of 6 terms.

b) *D.M /M.Ch*

The courses of study shall be for a period of 3 years consisting of 6 terms.

c) *Diploma courses:*

The course of study shall be for a period of 2 years consisting of 4 terms.

5.2 Requirement to complete the course : Deleted*

6. Method of training

The training of postgraduate for degree/diploma shall be residency pattern with graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, grand rounds, case demonstration, clinics, journal review meetings, CPC and clinical meetings. Every candidate should be required to participate in the teaching and training programme of undergraduate students. Training should include involvement in laboratory and experimental work, and research studies. Basic medical sciences students should be posted to allied and relevant clinical departments or institutions. Similarly, clinical subjects' students should be posted to basic medical sciences and allied speciality departments or institutions.

7. Attendance, Progress and Conduct

7.1 A candidate pursuing degree/diploma course should work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate course.

* Vide Notification UA/ORD-6/99-2000 dated 9.4.2001

- 7.2 Each year shall be taken as a unit for the purpose of calculating attendance.
- 7.3 Every student shall attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons. (Please see chapter IV for details).
- 7.4 Every candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate course. Provided further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% attendance of training period every year.
- 7.5 Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the University Examinations.

8. Monitoring Progress of Studies:

8.1 *Work diary / Log Book* - Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc (Please see chapter IV for model check lists and log book specimen copy). Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.

8.2 *Periodic tests*: Increase of degree courses of three years duration (MD/MS, DM, MCh.), the concerned departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, particles / clinicals and viva voce. Records and marks obtained in such tests will be maintained by the Head of the Department and sent to the University, when called for.

In case of diploma courses of two years duration, the concerned departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

8.3 *Records*: Records and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

9. Dissertation

9.1 Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

9.2 The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

9.3 Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

9.4 Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

9.5 The dissertation should be written under the following headings:

- i. Introduction
- ii. Aims or Objectives of study
- iii. Review of Literature
- iv. Material and Methods
- v. Results
- vi. Discussion
- vii. Conclusion
- viii. Summary
- ix. References
- x. Tables
- xi. Annexures

9.6 The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

9.7 Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.

9.8 The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.

9.9 Guide: The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work is as per Medical Council of India Minimum Qualifications for Teachers in Medical Institutions Regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining post graduate degree shall be recognised as post graduate teachers.

A **Co-guide** may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/training by Rajiv Gandhi University of Health Sciences/Medical Council of India. The co-guide shall be a recognised post graduate teacher of Rajiv Gandhi University of Health Sciences.

9.10 Change of guide: In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.

10. Schedule of Examination

The examination for M.D / M.S courses shall be held at the end of three academic years (six academic terms). The examination for D.M and M.Ch courses shall be held at the end of three years. The examination for the diploma courses shall be held at the end of two academic years (four academic terms). The university shall conduct two examinations in a year at an interval of four to six months between the two examination. Not more than two examinations shall be conducted in an academic year.

11. Scheme of Examination

11.1 M.D. / M.S. Degree

M.D. / M.S. Degree examinations in any subject shall consist of dissertation, written paper (Theory), Practical/Clinical and Viva voce.

11.1.1 Dissertation: Every candidate shall carryout work and submit a dissertation as indicated in Sl.NO.9. Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

11.1.2 Written Examination (Theory): A written examination shall consist of **four** question papers, each of **three** hours duration. Each paper shall carry 100 marks. Out of the **four** papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences. Recent advances may be asked in any or all the papers. In basic medical subjects and para-clinical subjects, questions on applied clinical aspects should also be asked.

11.1.3 Practical / Clinical Examination:

In case of practical examination, it should be aimed at assessing competence and skills of techniques and procedures as well as testing students ability to make relevant and valid observations, interpretations and inference of laboratory or experimental work relating to his/her subject.

In case of clinical examination, it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine atleast one long case and two short cases.

The total marks for Practical / clinical examination shall be 200.

11.1.4 Viva Voce: Viva Voce Examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 100 and the distribution of marks shall be as under:

- | | |
|---|----------|
| (i) For examination of all components of syllabus | 80 Marks |
| (ii) For Pedagogy | 20 Marks |

11.1.5 Examiners: There shall be atleast four examiners in each subject. Out of them two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

11.1.6 Criteria for declaring as pass in University Examination* : A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical including clinical and viva voce examination.

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation).

11.1.7 Declaration of distinction: A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate marks is 75 percent and above.

* Amended as per notification UA/ORD-6/99-2000 dated 9.4.2001

Distinction will not be awarded for candidates passing the examination in more than one attempt.

11.2 D.M / M.Ch:

The examination shall consist of theory, clinical/practical and viva voce examination.

11.2.1 (Theory) (Written Examination): The theory examination shall consist of **four** question papers, each of **three** hours duration. Each paper shall carry 100 marks. Out of the **four** papers, the first paper will be on basic medical sciences. Recent advances may be asked in any or all the papers.

11.2.2 Practical / Clinical Examination:

In case of practical examination it should be aimed at assessing competence, skills of techniques and procedures as well as testing students ability to make relevant and valid observations, interpretation and experimental work relevant to his / her subject.

In case of clinical examination it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine atleast one long case and two short cases.

The maximum marks for Practical / Clinical shall be 200.

11.2.3 Viva Voce: Viva Voce examination shall aim at assessing thoroughly depth of knowledge, logical reasoning, confidence and oral communication skills. The maximum marks shall be 100.

11.2.4 Examiners: There shall be atleast four examiners in each subject. Out of them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

11.2.5 Criteria for declaring as pass in University Examination* : A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory (2) Practical including clinical and viva voce examination.

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation.)

* Amended as per notification UA/ORD-6/99-2000 dated 9.4.2001

11.3 Diploma Examination:

Diploma examination in any subject shall consist of theory (written papers), Practical / Clinical and Viva - Voce.

11.3.1 Theory: There shall be **three** written question papers each carrying 100 marks. Each paper will be of **three** hours duration. In clinical subjects one paper out of this shall be on basic medical sciences. In basic medical subjects and para clinical subjects, questions on applied clinical aspects should also be asked.

11.3.2 Practical / Clinical Examination:

In case of practical examination it should be aimed at assessing competence, skills related to laboratory procedures as well as testing students ability to make relevant and valid observations, interpretation of laboratory or experimental work relevant to his/her subject.

In case of clinical examination, it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine atleast one long case and two short cases.

The maximum marks for Practical / Clinical shall be 150.

11.3.3 Viva Voce Examination: Viva Voce examination should aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 50.

11.3.4 Criteria for declaring as pass in University Examination* : A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical including clinical and viva voce examination.

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation).

11. 3.5 Declaration of distinction: A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate marks is 75 percent and above. Distinction will not be awarded for candidates passing the examination in more than one attempt.

* Amended as per Notification UA/ORD/99-2000 dated 9.4.2001

11.3.6 Examiners: There shall be atleast four examiners in each subject. Out of them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

12. Number of Candidates per day. The maximum number of candidates for practical/clinical and viva-voce examination shall be as under:

MD / MS Course: Maximum of 6 per day

Diploma Course: Maximum of 8 per day

DM / M.Ch Course: Maximum of 3 per day

CHAPTER II

Goals and General Objectives of Postgraduate Medical Education Program

Goal

The goal of postgraduate medical education shall be to produce a competent specialist and /or a medical teacher:

- (i) who shall recognise the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy;
- (ii) who shall have mastered most of the competencies, retraining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system;
- (iii) who shall be aware of the contemporary advances and developments in the discipline concerned;
- (iv) who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology; and
- (v) who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

General Objectives

At the end of the postgraduate training in the discipline concerned the student shall be able to:

- i) Recognise the importance of the concerned speciality in the context of the health need of the community and the national priorities in the health sector.
- ii) Practice the speciality concerned ethically and in step with the principles of primary health care.
- iii) Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

- iv) Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and promotive measures/strategies.
- v) Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- vi) Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
- vii) Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation.
- viii) Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- ix) Play the assigned role in the implementation of national health programmes, effectively and responsibly.
- x) Organise and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- xi) Develop skills as a self-directed learner, recognise continuing educational needs; select and use appropriate learning resources.
- xii) Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
- xiii) Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- xiv) Function as an effective leader of a health team engaged in health care, research or training.

Statement of the Competencies

Keeping in view the general objectives of postgraduate training, each disciplines shall aim at development of specific competencies, which shall be defined and spelt out in clear terms. Each department shall produce a statement and bring it to the notice of the trainees in the beginning of the programme so that he or she can direct the efforts towards the attainment of these competencies.

Components of the PG Curriculum

The major components of the PG curriculum shall be:

- Theoretical knowledge
- Practical/clinical Skills
- Training in Thesis.
- Attitudes, including communication.
- Training in research methodology.

Source : Medical Council of India, Regulations on Postgraduate Medical Education, 2000.

Chapter III

Post Graduate Courses in Anesthesiology

M. D. Anesthesiology

Goals:

The goals of three year degree course in Anaesthesiology would be to train a MBBS doctor who after the satisfactory completion of which shall:

1. Practice independently the art and science of Anaesthesiology and Resuscitation effectively and ethically, backed by scientific knowledge and skill base.
2. Undertake responsibilities in critical care unit, trauma unit, and respiratory therapy unit of unconscious patients requiring ventilatory support.
3. Undertake acute and chronic pain management.
4. Continue to evince keen interest in continuous professional development irrespective of whether he is in a teaching institution or in private anaesthetic practice.
5. Be a dedicated, motivated teacher who is always keen to train or to share his knowledge and skills with a colleague or junior or any learner.

Objectives:

The following objectives are laid out to achieve the goals of the course. These objectives have to be achieved by the candidates by the time of completion of the course. The objectives may be considered under the following headings.

1. Knowledge (Cognitive domain)
2. Skills (Psychomotor domain)
3. Attitudes communication skills, human values and ethical practice.

At the end of the training the candidate must be able to:

Knowledge:

- Demonstrate understanding of basic sciences relevant to Anaesthesia.
- Describe the Anaesthetic Management of common and uncommon surgical ailments belonging to various branches of surgery, at all ages requiring operative interventions with a basic knowledge of the aetiology, pathophysiology and the surgical treatment of the conditions.
- Describe the underlying theoretical background of mechanism pain perception and pain management.
- Describe the theory of the underlying aetiology, mechanism and management of the conditions requiring resuscitation.
- Demonstrate understanding of the theoretical base of polytrauma and the science of resuscitation.
- Recognise the conditions that may be outside the area of his competence and refer them to an appropriate specialist prior to anaesthetising them.

- Advise regarding the anaesthetic management of any surgical case and to carry out this management effectively.
- Update himself / herself by self-study and by attending courses, conferences and seminars relevant to anaesthesia.
- Teach and guide his team colleagues and students.
- Demonstrate understanding of medicolegal aspects of anaesthesia.
- Demonstrate basic knowledge of the administrative aspects operating rooms complex.
- Undertake audit, use information technology tools and carryout research, both basic and clinical, with the aim of publishing the work and presenting the same at various scientific fora.

Skills:

- Perform 'Pre-Anaesthetic Evaluation' of patients undergoing surgery by taking, proper clinical history, examining the patient, ordering relevant investigations and interpreting them to have additional information about the surgical condition, and or the associated medical condition, which warrant the modification of the proposed anaesthetic management.
- Administer anaesthesia (general and or regional) to common surgical operations independently and to superspecialisations like cardiac surgery, neurosurgery etc. with the help of a senior anaesthesiologist.
- Provider Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS).
- Manage airway and perform ventilatory care etc., of unconscious and polytrauma cases as a member of trauma team and critical care unit team.
- Undertake complete patient monitoring including preoperative, intra-operative and postoperative ventilatory care of the patients.
- Perform acute and chronic pain management.

Attitudes and Communication Abilities:

- Adopt ethical principles in all aspects of his anaesthetic practice. Professional honesty and integrity are to be fostered. Anaesthesia care to be delivered to all in need, irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain the various options available in the anaesthetic management, critical care, pain management and to obtain a true informed consent from the patient.
- Provide leadership in the operating room environment and get best out of the team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.

- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents:

It includes topics not only of Anaesthesiology but also those aspects of all the other branches of medicine relevant to Anaesthesia viz., Medicine and its allied subjects, Surgery and its allied branches, Pediatrics, applied Anatomy, Physiology, Pathology, Pharmacology, Microbiology etc. It is intended as a guide to the candidates and it is not comprehensive. As and when there is newer development, it becomes eligible for inclusion. Hence, the candidates should be familiar themselves with the current content of the scientific journals and reviews of major topics, in Anaesthesia.

1. History of Anaesthesiology.
2. Basic Sciences related to Anaesthesia including Anatomy, Physiology, Pharmacology, Biochemistry, Patho physiology, Immunology and Genetics.
3. Medicine applied to Anaesthesiology.
4. Physics related to Anaesthesiology, Electronics, Computers and Lasers, in Anaesthesiology. Internet/Medline and its uses and applications
5. Anaesthesiology.
 - i. Pre anaesthetic evaluation and preparation.
 - ii. Principles and Practice of Anaesthesiology including pre, per and post operative care, of patients belonging to General Surgery and other subspecialties like Cardiothoracic Surgery, Neurosurgery, Orthopaedics, Plastic Surgery and Surgical Endocrinology, Surgical Oncology, Paediatric, Obstetrics and Gynaecology, ENT, Ophthalmology, Urology, Dental Surgery, Laproscopy Surgery etc.
 - iii. Blood transfusion-Fluid and Electrolyte balance, - Acid Base Balance.
 - iv. Fires and Explosion in operation theatre.
 - v. Operation Theatre sterilization procedures.
6. Pain Clinic organisation and management. Pain pathway, and management of pain.
7. Respiratory Therapy and management of both acute and chronic respiratory insufficiencies and ventilator commitments in I.C.U.
8. Critical Care Anaesthesiology and Trauma Care unit management.
 - Different methods of anaesthetic Techniques.
 - Regional anaesthesia including spinal, epidural and caudal etc.
 - Local Anaesthesia including nerve blocks.
 - Anaesthesia in abnormal environments like high attitude anaesthesia etc.
 - Complication in Anaesthesiology and their management both per and post operatively.
 - Anaesthesia for day care surgery.
 - Anaesthesia for diagnostic procedure like endoscopy C.T. Scan M.R.I. etc.
9. Informed consent/medicolegal issues: understanding the implications of acts of omission and commission in practice. Issues regarding consumer protection.

Implications in medicolegal cases.

10. Communication skills with colleagues teachers, patient's, and patients relatives.
11. Principles of Anaesthesia audit understanding the audit process and outcome; methods adopted for the same.
12. Essentials of Research methodology:
 - i. Basics of Biostatistics and its application.
 - ii. Ability to undertake clinical and basic research.
 - iii. Ability to publish results of one's work.
13. Principles of Evidence Based Medicine and its application in anaesthetic practice.
14. Medical Ethics/social responsibilities of the anaesthesiologists.
15. Record keeping: Ability to keep records as scientifically as possible; knowledge of computers is beneficial.

TECHNICAL SKILLS TO BE ACQUIRED:

The list within the tables indicates the procedures that the student should by the end of the course, be able to perform independently (PI) by himself / herself, should have performed with assistance (PA) should have observed (O) or assisted (A) during the course. NA - Not Applicable

Skills may be considered under the following headings:

1. Basic Graduate Skills.
2. Anaesthesia Procedures.
3. Critical Care Procedures.
4. Emergency Room Procedures.
5. Pain Alleviation Procedures.

a) Basic Graduate Skills:

The student should have acquired the certain skills during his undergraduation and internship. These skills have to be reinforced at the beginning of the training period. These include;

Procedure	Category	Year	No.
Insertion of I.V. lines	PI	I	100
Insertion of Nasogastric Tubes	PI	I	100
Recording of Vital Signs.	PI	I	100

b) Anaesthesia Procedures:

Orotracheal intubation	PI	I/II/III	100
Nasotracheal Intubation	PI	I/II/III	50
LMA insertion	PI	I/II/III	50
Airway (Oral/Nasal) Insertion	PI	I/II/III	100
Subarachnoid block	PI	I/II/III	100
Epidural block (including caudal)	PI	I/II/III	10
Brachial Plexus block	PI	II/III	5
Intravenous Regional Analgesia	PI	II/III	5
Three in One block	PI	II/III	2
Rectus Sheath Block	PI	II/III	2
Hernia Block	PI	II/III	2
Other nerve blocks	PI	II/III	NA
Major Anaesthesia Procedures	PA/PI	II/III (Per year)	100
Minor Anaesthesia Procedures	PA/PI	II/III (Per year)	200

c) Critical Care Procedures:

Insertion of Arteriallines	PI	II/III	5
Insertion of Central Venous Lines	PI	II/III	5
Intercostal Drainage	O	II/III	NA
Tracheostomy	O	III	NA
Ventilatory Management of Patients	PI	II/III	NA
Sampling for & Interpretation of ABG	PI	II/III	NA
Correction of Electrolyte imbalance	PI	II/III	NA
Fiberoptic Bronchoscopy	PA	III	NA
Minitriacheostomy	PA	III	NA
Insertion of S.W.G. Catheter	O	III	NA

d) Emergency Room Procedures:

Cardiopulmonary Resuscitation (BLS & ACLS)	PI	I/II/III	NA
Management of Cardiac failure	PI	II/III	2
Management of Respiratory Failure	PI	II/III	2
Management of Shock	PI	II/III	2
Management of Airway Obstruction	PI	I/II/III	5

e) Pain Alleviation Procedures:

Stellate ganglion block	PA	III	2
Coeliae ganglion block	PA	III	2
Trigeminal Nerve block	PA	III	2
Labour analgesia	PI	II/III	
Post Operative Pain Management	PI	II/III	100
Neurolysis, & Other nerveablation procedures	PA	III	2
TENS	PI	II/III	2

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself/herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. **Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) Didactic Lectures: Recommended for selected common topics for postgraduate students of all specialities. Few topics are suggested as examples:

- 1) Bio-statistics.
- 2) Use of library
- 3) Research Methods

- 4) Medical code of Conduct and Medical Ethics.
- 5) National health and Disease Control Programs.
- 6) Communication Skills etc.
- 7) Initial introductory lectures about the subject.

These topics may preferably taken up in the first few weeks of the 1st year.

- b) Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, e.g. Jaundice, Diabetes Mellitus, Thyroid etc.
2. **Journal Club**: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must make a presentation from the allotted journal(s) of selected articles at least four times a year and a total of 12 presentations in three years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See Checklist in Chapter IV). A time table with names of the students and the moderator should be announced at the beginning of every year.
 3. **Subject seminar**: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.
 4. **Student Symposium**: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.
 5. **Ward Rounds**: May be service rounds or teaching rounds.
 - a) Service Rounds: Postgraduate students should do ward rounds every day.
 - i) For pre anaesthetic evaluation of the patients posted for operation.
 - ii) And to do the post anaesthetic follow up of operated patients for alleviation of post-operative pain and for diagnosis and management if any of the post-operative sequelae.
 - b) Teaching Rounds: Every unit should have grand round for teaching clinical methods and pre anaesthetic evaluation.

Entries of (a) and (b) should be made in the Logbook.

6. **Mortality & Morbidity Meetings:** Recommended once a month for all postgraduate students. Presentation be done by rotation and by the students who had conducted/assisted anaesthetic management.
7. **Inter Departmental Meetings:** Strongly recommended particularly with departments of surgery & medicine at least once a month. These meetings should be attended by postgraduate students and relevant entries must be made in the Logbook.
8. **Teaching skills:** Postgraduate students must teach Undergraduate students (e.g. Medical, Nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by faculty. Record of their participation should be kept in Logbook. Training of postgraduate students in Educational Technology is recommended.
9. **Continuing Medical Education Programmes (CME):** At least 2 state / national level CME programmes should be attended by each student in 3 years.
10. **Conferences:** Attending conferences is optional. However participation & presentation of scientific paper should be encouraged.

Dissertation:

Every candidate pursuing MD degree course in Anaesthesiology is required to carry out work on a selected research project under the guidance of recognised postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

1. The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
2. Every candidate shall submit to University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
3. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No changes in the dissertation topic or guide shall be made without prior approval of the University.
4. The dissertation should be written under the following headings:
 - i. Introduction

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- ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion
 - vii. Conclusion
 - viii. Summary
 - ix. References
 - x. Tables
 - xi. Annexure
5. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other Checklists. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.
6. Four copies of dissertation thus prepared shall be submitted to the University, six months before final examination on or before the dates notified by the University.
7. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
8. **Guide:** The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work shall be as per Medical Council of India Minimum Qualifications for Teachers in Medical Institutions regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining postgraduate degree, shall be recognised as postgraduate teachers.
A Co-guide may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/training by the University / Medical Council of India. The co-guide shall be a recognised postgraduate teacher.
9. **Change of guide:** In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.
10. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Rotation and Posting in other Departments

The listed knowledge and skills are to be learnt over a period of 3 years. The process is a continuous one. However the recommended period and timing of training in basic sciences, allied departments and speciality departments are given below. The total duration of postings in allied and subspecialties will be 8 months and the remaining 2 years and 4 months in the mother department.

Basic Sciences: Rotation in these departments viz., Anatomy, Physiology, Pharmacology etc. are to be done as concurrent studies during the 1st year of training. At least two hours may be spent in the first six months of the course. Basic Science relevant to Anaesthesia can be studied in the respective departments in the afternoons.

Anatomy: Special emphasis for the dissection of larynx, trachea, heart, various nerves & plexuses.

Physiology: Thorough revision of all the systems, in particular Cardio Vascular System and Respiratory System.

Pharmacology: of Drugs used in Anaesthesia and drugs used for management of systemic disease & Drug interactions.

Allied Speciality: Students should be posted ICU, ICCU, SICU (Trauma unit) and pain clinic during 2nd year of Training for 2 weeks in each, for total duration of 2 months.

Other Subspecialties of Anaesthesia:

Posting to other subspecialty departments will be during 2nd year and the duration of postings are as under;

Cardiothoracic Surgery	--	4 weeks
Neuro Surgery	--	4 weeks
Paediatric Surgery	--	4 weeks
Cancer Surgery	--	2 weeks
Oromaxillary Surgery	--	2 weeks
Plastic Surgery	--	2 weeks
Urology	--	2 weeks
Laposcopic and Endoscopic Surgery	--	2 weeks
Anaesthesia for investigative Procedure like CT Scan, Lithotripsy, Cardiac Cath Lab	--	2 weeks

24 weeks

Yearwise Structured Training Schedule

First Year :

1. Basic Sciences related to Anaesthesiology: Theoretical knowledge, Frequent visits to Anatomy dissection halls & Museum, Physiology Laboratories etc., to revise the relevant subjects.
2. Theoretical knowledge of Anaesthesiology & Resuscitation: Special emphasis on clinical examination of patients, learning clinical methods, arriving at correct diagnosis.
3. Basic knowledge about
Computers in Anaesthesia, Medline, Internet.
Bio Statistics.
Medical Audit.
Medicolegal Aspects.
Research Methodology.
Evidence Based Medicine.
Medical Ethics, & Social responsibilities of Anaesthesiologists.
4. Learning of communication skills.
5. Anaesthesia Skills
 - Pre Anaesthetic evaluation / under supervision.
 - Monitoring of patients through out perioperative period.
 - Assisting setting up of Anaesthesia Machine, Monitor & Ventilator.
 - Assisting the conduct of Anaesthesia for major surgeries; knowledge about the complications of Anaesthesia.
 - Assisting for short anaesthesia initially and later on doing independently under supervision
 - Conduct of Anaesthesia OPD.
 - CPR training and mastering of BLS & ACLS.
6. **Dissertation:** Choosing a topic of dissertation, submission of synopsis to the university, collection of literature, conduct of pilot studies.

Second Year:

1. Theoretical knowledge of allied subjects, subspecialties of Anaesthesia. Assisting senior anaesthesiologists in specialised branches like paediatric surgery, cardiothoracic surgery, critical care trauma etc.
2. Anaesthetic Skills: At the end of 2nd year the student should be capable of;
 - a) Anaesthetising patients without assistance but under supervision.
 - b) Identifying the complication of anaesthesia and manage them independently but under supervision.
 - c) Setting up of Anaesthesia Machine, monitor and ventilator independently.
3. Conference & Workshops: Attending one state level and one national level conference/CME and presentation of a scientific paper.

4. Dissertation: Carrying out of the dissertation study work, periodic reviews, interaction with guide. Organisation of the data writing up of the manuscript of dissertation at end of 2nd year.
5. The student should be actively involved in presentation of seminars, journal clubs, case presentation/discussions.

Third Year:

1. The student should be well versed with basics, allied subjects and recent advances in the respective fields.
2. Anaesthesia Skills: At the end of the 3rd year the candidate should be able to make independent decisions as regards anaesthesia, pain management and post operative care of all kinds of patients.
3. Teaching Activities: Final year student should take lead in conducting seminars, journal clubs, case discussions, panel discussions with I & II year students. The third year students should also involve in teaching undergraduate students specially bedside clinics.
4. Dissertation: The completed dissertation must be submitted to the University, 6 months before the examination before the notified date.
5. The student must get expertise in the specialised procedures as noted in the course content table.

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) *Personal Attitudes*. The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues

- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) ***Clinical skills***

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

(iv) **Teaching skills** : Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

(v) **Dissertation in the Department** : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

(vi) **Work diary / Log Book** - Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.

(vii) **Periodic tests**: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

(viii) **Records**: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV, Copies may be made and used by the institutions.

Procédure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend

that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

A) Theory:

Written examination shall consist of four question papers each of three hours duration. Each paper shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows:

Paper I : Basic Science as applicable to Anaesthesia.

1. Anatomy.
2. Physiology.
3. Pharmacology.
4. Physics.
5. Biochemistry.
6. Patho Physiology.
7. History
8. Equipments.

Paper II : Clinical Practice of Anaesthesia.

1. Cardio Vascular System.
2. Respiratory System.
3. Neuro Surgery.
4. Obstetrics & Gynecology
5. Orthopaedics.
6. Ophthalmology.

Paper III: Clinical Practice of Anaesthesia.

1. Paediatrics.
2. Renal & Hepatic system.
3. Endocrines.
4. Haemopoietics.
5. Geriatrics
6. E.N.T.
7. Out Patient Anesthesia & Dental Anaesthesia.
8. Nerve Blocks.

Paper IV Applied Medicine in Relation to Anaesthesia.

Theoretical Aspects of pain and pain relief including postoperative & Cancer Pain.

Note: The distribution of chapters / topics shown against the papers are suggestive only.

B) Clinical Examination:**200 marks**

It should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidates should examine & present atleast one long case (carrying 100 marks) and two short cases (each carrying 50 marks). The total marks for clinical examination shall be 200.

C) Viva-Voce:**100 marks**

Viva-Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 100 and the distribution of marks shall be as under;

- i. For examination of all components of syllabus 80 marks
All examiners will conduct viva-voce conjointly on candidates comprehension, analytical approach expression and interpretation of data. It includes all components of course contents. In addition, the candidate may also be given, instruments/equipments, X-ray images, ABG reports, ECG strips, Drugs Ultrasound/Echocardiography reports & specimen. It includes discussion on dissertation also.
- ii. For teaching skills (Pedagogy) 20 marks
A topic to be given to each candidate in the beginning of clinical examination. He / She is asked to make presentation on the topic for 8 to 10 minutes.

Maximum marks for	Theory	Practical	Viva	Grand Total
M.D. Anaesthesiology	400	200	100	700

Recommended Books and Journals**Books:**

1. Practice of Anesthesiology - Wylie - Churchill - Davidson.
2. General Anesthesia - Gray, Nunn, Utting.
3. Anaesthesia - Two volumes, Ronald D, Miller.
4. Anatomy for Anaesthetist - Harold Willis
5. Understanding Anesthetist Equipments - Dorsh & Dorsh.
6. Emergency Anaesthesia - Thronton
7. Principles of Obstetric - Anesthesia - J. S. Crawford.
8. Physics for Anesthetist - Muscnin & Mactintosh.
9. Neuro Surgical Anaesthesia - Hunter
10. Paediatric Anaesthesia - Gregory.
11. Cardiac Anaesthesiology - 2 volumes - Jonathan Benumfit.
12. Anaesthesia and co existing diseases - Stocltng.

13. Anaesthesia Equipment - Ehrenwerth and James. B. Eiscnkraft
14. Text Book of Anaesthesia - A. R. Aitken Head & G. Smith
15. Anaesthesia for infants and children - Smith
16. Obstetrics Anaesthesia and Andgest - Bonica
17. Regional Anaesthesia - Mahentosh series
18. Epideral Analgesia - Broomage
19. Medical problems of Anaesthesia - Kaulman
20. Principles of Anaesthesiology - Collins
21. Anaesthesia for Orthopedic Surgery - Zauder & other
22. Neural Blockade - Cousins
23. Cardiac Anaesthesia - Kaplar
24. Thoracic Anaesthesia - Kaplan and Muschin
25. Regional Anaesthesia - Labot
26. Drugs Interactions & other basic Medical science and Anaesthesia speciality books as available.

Journals

1. Anaesthesiology and Analgesia Journal (States)
2. Anaesthesiology Journal
3. Anaesthesia Journal
4. Acta Anaesthesia Scandinavia
5. Canadian Journal of Anaesthesia
6. Indian Journal of Anaesthesia
7. British Journal of Anaesthesia
8. Expert Anaesthesia
9. Recent advances in Anaesthesiology
10. Year Book of Anaesthesia
11. Anaesthesia Clinics
12. Clinics in North America in Anaesthesiology

Diploma in Anaesthesiology (DA)

Goals:

The goals of two years diploma course in Anaesthesiology would be to train a MBBS doctor who after the satisfactory completion of which shall;

1. Practice independently the art and science of Anaesthesiology and Resuscitation effectively and ethically, backed by scientific knowledge and skill base.
2. Undertake responsibilities in critical care unit, trauma unit, and respiratory therapy unit of unconscious patients requiring ventilatory support.
3. Undertake acute and chronic pain management.
4. Continue to evince keen interest in continuous professional development irrespective of whether he is in a teaching institution or in private anaesthetic practice.

Objectives:

The following objectives are laid out to achieve the goals of the course. These objectives have to be achieved by the candidates by the time of completion of the course. The objectives may be considered under the following headings.

1. Knowledge (Cognitive domain)
2. Skills (Psychomotor domain)
3. Attitudes communication skills, human values and ethical practice.

At the end of the training the candidate must be able to:

Knowledge:

- Demonstrate understanding of basic sciences relevant to Anaesthesia.
- Describe the Anaesthetic Management of common and uncommon surgical ailments belonging to various branches of surgery, at all ages requiring operative interventions with a basic knowledge of the aetiology, pathophysiology and the surgical treatment of the conditions
- Describe the underlying theoretical background of mechanism pain perception and pain management.
- Describe the theory of the underlying aetiology, mechanism and management of the conditions requiring resuscitation.
- Demonstrate understanding of the theoretical base of polytrauma and the science of resuscitation.
- Recognise the conditions that may be outside the area of his competence and refer them to an appropriate specialist prior to anaesthetising them.
- Advise regarding the anaesthetic management of any surgical case and to carry out this management effectively.

- Update himself / herself by self-study and by attending courses, conferences and seminars relevant to anaesthesia.
- Demonstrate understanding of medico-legal aspects of anaesthesia.

Skills:

- Perform 'Pre-Anaesthetic Evaluation' of patients undergoing surgery by taking, proper clinical history, examining the patient, ordering relevant investigations and interpreting them to have additional information about the surgical condition, and or the associated medical condition, which warrant the modification of the proposed anaesthetic management.
- Administer anaesthesia (general and or regional) to common surgical operations independently and to superspecialisations like cardiac surgery, neurosurgery etc. with the help of a senior anaesthesiologist.
- Provider Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS).
- Manage airway and perform ventilatory care etc., of unconscious and polytrauma cases as a member of trauma team and critical care unit team.
- Undertake complete patient monitoring including preoperative, intra-operative and postoperative ventilatory care of the patients.
- Perform acute and chronic pain management.

Attitudes and Communication Abilities:

- Adopt ethical principles in all aspects of his anaesthetic practice. Professional honesty and integrity are to be fostered. Anaesthesia care is to be delivered to all in need, irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain the various options available in the anaesthetic management, critical care, pain management and to obtain a true informed consent from the patient.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents:

It includes topics not only of Anaesthesiology but also those aspects of all the other branches of medicine relevant to Anaesthesia viz., Medicine and its allied subjects, Surgery and its allied branches, Pediatrics, applied Anatomy, Physiology, Pathology, Pharmacology, Microbiology etc. It is intended as a guide to the candidates and it is not comprehensive. As and when there is newer development, it becomes eligible for inclusion. Hence, the candidates should be familiar themselves with the current content of the scientific journals and reviews of major topics, in Anaesthesia.

1. History of Anaesthesiology.

2. Basic Sciences related to Anaesthesia including Anatomy, Physiology, Pharmacology, Biochemistry, Patho physiology, Immunology and Genetics.
3. Medicine applied to Anaesthesiology.
4. Physics related to Anaesthesiology, Electronics, Computers and Lasers, in Anaesthesiology. Internet/Medline and its uses and applications
5. Anaesthesiology.
 - i. Pre anaesthetic evaluation and preparation.
 - ii. Principles and Practice of Anaesthesiology including pre, per and post operative care, of patients belonging to General Surgery and other subspecialties like Cardiothoracic Surgery, Neurosurgery, Orthopaedics, Plastic Surgery and Surgical Endocrinology, Surgical Oncology, Paediatric, Obstetrics and Gynaecology, ENT, EYE, Urology, Dental Surgery, Laproscopy Surgery etc.
 - iii. Blood transfusion-Fluid and Electrolyte balance, - Acid Base Balance.
 - iv. Fires and Explosion in operation theatre.
 - v. Operation Theatre sterilization procedures.
6. Pain Clinic organisation and management. Pain pathway, and management of pain.
7. Respiratory Therapy and management of both acute and chronic respiratory insufficiencies and ventilator commitments in I.C.U.
8. Critical Care Anaesthesiology and Trauma Care unit management.
 - Different methods of anaesthetic Techniques.
 - Regional anaesthesia including spinal, epidural and caudal etc.
 - Local Anaesthesia including nerve blocks.
 - Anaesthesia in abnormal environments like high attitude anaesthesia etc.
 - Complication in Anaesthesiology and their management both per and post operatively.
 - Anaesthesia for day care surgery.
 - Anaesthesia for diagnostic procedure like endoscopy C.T. Scan M.R.I. etc.
9. Informed consent/medicolegal issues: understanding the implications of acts of omission and commission in practice. Issues regarding consumer protection. Implications in medico-legal cases.
10. Communication skills with colleagues teachers, patient's, and patients relatives.
11. Principles of Anaesthesia audit understanding the audit process and outcome; methods adopted for the same.
13. Principles of Evidence Based Medicine and its application in anaesthetic practice.
14. Medical Ethics/social responsibilities of the anaesthesiologists.
15. Record keeping: Ability to keep records as scientifically as possible; knowledge of computers is beneficial.

Technical Skills to be Acquired:

The list with in the tables indicates the procedures that the student should by the end of the course, be able to perform independently (PI) by himself / herself, should

have performed with assistance (PA) should have observed (O) or assisted (A) during the course. NA - Not Applicable

Skills may be considered under the following headings:

1. Basic Graduate Skills.
2. Anaesthesia Procedures.
3. Critical Care Procedures.
4. Emergency Room Procedures.
5. Pain Alleviation Procedures.

a) Basic Graduate Skills :

The student should have acquired certain skills during his undergraduation and internship. There skills have to be reinforced at the beginning of the training period. They include;

Procedure	Category	Year	No.
Insertion of I.V. lines	PI	I	75
Insertion of Nasogastric Tubes	PI	I	75
Recording of Vital Signs.	PI	I	75

b) Anaesthesia Procedures :

Orotracheal intubation	PI	I/II	75
Nasotracheal Intubation	PI	I/II	25
LMA insertion	PI	I/II	25
Airway (Oral/Nasal) Insertion	PI	I/II	75
Subarachnoid block	PI	I/II	75
Epidural block (including caudal)	PI	I/II	5
Brachial Plexus block	PI	II	2
Intravenous Regional Analgesia	PI	II	2
Three in One block	PI	II	2
Rectus Sheath Block	PI	II	2
Hernia Block	PI	II	2
Other nerve blocks	PI	II	NA

Major Anaesthesia Procedures	PA/PI	II (Per year)	100
Minor Anaesthesia Procedures	PA/PI	II (Per year)	200
c) Critical Care Procedures:			
Insertion of Arteriallines	PI	II	2
Insertion of Central Venous Lines	PI	II	2
Intercostal Drainage	O	II	
Tracheostomy	O	II	NA
Ventilatory Management of Patients	PI	II	NA
Sampling for & Interpretation of ABG	PI	II	NA
Correction of Electrolyte imbalance	PI	II	NA
Fiberoptic Bronchoscopy	O	II	NA
Minitriacheostomy	O	II	NA
Insertion of S.W.G. Catheter	O	II	NA
d) Emergency Room Procedures:			
Cardiopulmonary Resuscitation (BLS & ACLS)	PI	I/II	NA
Management of Cardiac failure	PI	II	2
Management of Respiratory Failure	PI	II	2
Management of Shock	PI	II	2
Management of Airway Obstruction	PI	I/II	5
e) Pain Alleviation Procedures:			
Stellate ganglion block	PA	III	2
Coeliae ganglion block	PA	III	2
Trigeminal Nerve block	PA	III	2
Labour analgesia	PI	II/III	
Post Operative Pain Management	PI	II/III	100
Neurolysis, & Other nerveablation procedures	PA	III	2
TENS	PI	II/III	2

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself/herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below. Depending on the facilities available, any or all of these methods may be employed.

1. **Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.
 - a) Didactic Lectures: Recommended for selected common topics for postgraduate students of all specialities. Few topics are suggested as examples:
 - 1) Bio-statistics.
 - 2) Use of library
 - 3) Medical code of Conduct and Medical Ethics.
 - 4) National health and Disease Control Programs.
 - 5) Communication Skills etc.
 - 6) Initial introductory lectures about the subject.

These topics may preferably taken up in the first few weeks of the 1st year.

- b) Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, e.g. Jaundice, Diabetes Mellitus, Thyroid etc.
2. **Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must make a presentation from the allotted journal(s) of selected articles at least four times a year and a total of 8 presentations in two years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable with names of the students and the moderator should be announced at the beginning of every year.
3. **Subject seminar:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 8 seminar presentations in two years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.

4. **Student Symposium:** Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.
5. **Ward Rounds:** May be service rounds or teaching rounds.
 - a) Service Rounds: Postgraduate students should do ward rounds every day.
 - i) For pre anaesthetic evaluation of the patients posted for operation.
 - ii) And to do the post anaesthetic follow up of operated patients for alleviation of post-operative pain and for diagnosis and management if any of the post-operative sequelae.
 - b) Teaching Rounds: Every unit should have grand round for teaching clinical methods and pre anaesthetic evaluation.

Entries of (a) and (b) should be made in the Logbook.
6. **Mortality & Morbidity Meetings:** Recommended once a month for all postgraduate students. Presentation be done by rotation and by the students who had conducted/assisted anaesthetic management.
7. **Inter Departmental Meetings:** Strongly recommended particularly with departments of surgery & medicine at least once a month. These meetings should be attended by postgraduate students and relevant entries must be made in the Logbook.
8. **Continuing Medical Education Programmes (CME):** At least 2 state / national level CME programmes should be attended by each student in 3 years.
9. **Conferences:** Attending conferences is optional. However, participation & presentation of scientific paper should be encouraged.

Rotation and Posting in other Departments

The listed knowledge and skills are to be learnt over a period of 3 years. The process is a continuous one. However, the recommended period and timing of training in basic sciences, allied departments and speciality departments are given below. The total duration of postings in allied and subspecialties will be 6 months and the remaining 1 year and 6 months in the mother department.

Basic Sciences: Rotation in these departments viz., Anatomy, Physiology, Pharmacology etc. are to be done as concurrent studies during the 1st year of training. At least two hours may be spent in the first six months of the course. Basic Science relevant to Anaesthesia can be studied in the respective departments in the afternoons.

Anatomy: Special emphasis for the dissection of larynx, trachea, heart, various nerves & plexuses,.

Physiology: Thorough revision of all the systems, in particular Cardio Vascular System and Respiratory System.

Pharmacology: of Drugs used in Anaesthesia and drugs used for management of systemic disease & Drug interactions.

Allied Speciality: Students should be posted ICU, ICCU, SICU (Trauma unit) and pain clinic during 2nd year of Training for 2 weeks in each, for total duration of 1 months.

Other Subspecialties of Anaesthesia:

Posting to other subspecialty departments will be during 2nd year and the duration of postings are as under;

Cardiothoracic Surgery	--	3 weeks
Neuro Surgery	--	3 weeks
Paediatric Surgery	--	3 weeks
Cancer Surgery	--	2 weeks
Oromaxillary Surgery	--	2 weeks
Plastic Surgery	--	2 weeks
Urology	--	2 weeks
Laposcopic and Endoscopic Surgery	--	2 weeks
Anaesthesia for investigative Procedure like CT Scan, Lithotripsy, Cardiac Cath Lab	--	1 weeks

20 weeks

Yearwise Structured Training Schedule

First Year:

1. Basic Sciences related to Anaesthesiology: Theoretical knowledge, Frequent visits to Anatomy dissection halls & Museum, Physiology Laboratories etc., to revise the relevant subjects.
2. Theoretical knowledge of Anaesthesiology & Resuscitation: Special emphasis on clinical examination of patients, learning clinical methods, arriving at correct diagnosis.
3. Basic knowledge about
Computers in Anaesthesia, Medline, Internet.
Bio Statistics.
Medical Audit.
Medicolegal Aspects.
Research Methodology.
Evidence Based Medicine.
Medical Ethics, & Social responsibilities of Anaesthesiologists.
4. Learning of communication skills.
5. Anaesthesia Skills
 - Pre Anaesthetic evaluation / under supervision.
 - Monitoring of patients through out perioperative period.
 - Assisting setting up of Anaesthesia Machine, Monitor & Ventilator.
 - Assisting the conduct of Anaesthesia for major surgeries; knowledge about the complications of Anaesthesia.
 - Assisting for short anaesthesia initially and later on doing independently under supervision
 - Conduct of Anaesthesia OPD.
 - CPR training and mastering of BLS & ACLS.

Second Year:

1. Theoretical knowledge of allied subjects, subspecialties of Anaesthesia. Assisting senior anaesthesiologists in specialised branches like paediatric surgery, cardiothoracic surgery, critical care trauma etc.
2. Anaesthetic Skills: At the end of 2nd year the student should be capable of;
 - a) Anaesthetising patients without assistance but under supervision.
 - b) Identifying the complication of anaesthesia and manage them independently but under supervision.
 - c) Setting up of Anaesthesia Machine, monitor and ventilator independently.
3. Conference & Workshops: Attending one state level and one national level conference/CME and presentation of a scientific paper.
4. The student should be actively involved in presentation of seminars, journal clubs, case presentation/discussions.
5. The student should be well versed with basics, allied subjects and recent advances in the respective fields.
1. Anaesthesia Skills: At the end of the 2nd year the candidate should be able to make independent decisions as regards anaesthesia, pain management and post operative care of all kinds of patients.
2. The student must get expertise in the specialised procedures as noted in the course content table.

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, and (iii) Clinical and operative skills.

i) **Personal Attitudes.** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues

- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) ***Clinical skills***

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct

observation. Particulars are recorded by the student in the log book. (Table No.3; Chapter IV)

iv) *Periodic tests:*

The departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book-* Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

(viii) *Records:* Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

A) Theory:

Written examination shall consist of three question papers each of three hours duration. Each paper shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100.

Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows:

Paper I - Basic Science as applicable to Anaesthesia.

1. Anatomy.
2. Physiology.
3. Pharmacology.
4. Physics.
5. Biochemistry.
6. History of Anaesthesia.

Paper II - Clinical Practice of Anaesthesia.

1. Cardio Vascular System.
2. Respiratory System.
3. Neuro Surgery.
4. Paediatrics
5. Obstetrics & Gynecology.
6. Orthopaedics.
7. Renal & Hepatic System.
8. Ophthalmology.

Paper III - Clinical Practice of Anaesthesia.

1. ENT
2. Endocrines.
3. Geriatrics
4. Out patient Anaesthesia & Dental Anaesthesia.
5. Critical Care - includes Basic Life Support (Cardio Pulmonary Resuscitation), Post operative care of all surgical patients, Management of poisoning, snake bite, unconscious patients. - Respiratory Therapy.

Note: The distribution of chapters / topics shown against the papers are suggestive only.

B) Clinical Examination: 150 marks

It should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine and present at least one long case (carrying 80 marks) and two short cases (each carrying 35 marks). The total marks for clinical examination shall be 150.

C) Viva-Voce:**50 marks**

Viva-Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 50 and the distribution of marks shall be as under;

- i. For examination of all components of syllabus 50 marks

All examiners will conduct viva-voce conjointly on candidates comprehension, analytical approach expression and interpretation of data. It includes all components of course contents. In addition the candidate may also be given, instruments/equipments, X-ray images, ABG reports, ECG strips, Drugs, Ultrasound/Echocardiography reports & specimen.

Maximum marks for	Theory	Practical	Viva	Grand Total
Dip. Anaesthesiology	300	150	50	500

Recommended Books and Journals**Books:**

1. Practice of Anesthesiology - Wylie - Churchill - Davidson.
2. General Anesthesia - Gray, Nunn, Utting.
3. Anaesthesia - Two volume, Ronald D, Miller.
4. Anatomy for Anaesthetist - Harold Willis
5. Understanding Anesthetist Equipments - Dorsh & Dorsh.
6. Emergency Anaesthesia - Thronton
7. Principles of Obstetric - Anesthesia - J. S. Crawford.
8. Physics for Anesthetist - Muscnin & Mactintosh.
9. Neuro Surgical Anaesthesia - Hunter
10. Paediatric Anaesthesia - Gregory.
11. Cardiac Anaesthesiology - 2 volumes - Jonathan Benumfit.
12. Anaesthesia & Co. existing diseases - Stoclting.
13. Anaesthesia Equipment - Ehrenwerth and James. B. Eiscnkraft
14. Text Book of Anaesthesia - A. R. Aitken Head & G. Smith
15. Anaesthesia for infants and children - Smith
16. Obstetrics Anaesthesia and Andgest - Bonica
17. Regional Anaesthesia - Mahentosh series
18. Epideral Analgesia - Broomage
19. Medical problems of Anaesthesia - Kaulman
20. Principles of Anaesthesiology - Collins
21. Anaesthesia for Orthopedic Surgery - Zauder & other

22. Neural Blockade - Cousins
23. Cardiac Anaesthesia - Kaplar
24. Thoracic Anaesthesia - Kaplan and Muschin
25. Regional Anaesthesia - Labot
26. Drugs Interactions & other basic Medical science and Anaesthesia speciality books available.

Journals

1. Anaesthesiology and Analgesia Journal (States)
2. Anaesthesiology Journal
3. Anaesthesia Journal
4. Acta Anaesthesia Scandinavia
5. Canadian Journal of Anaesthesia
6. Indian Journal of Anaesthesia
7. British Journal of Anaesthesia
8. Expert Anaesthesia
9. Recent advances in Anaesthesiology
10. Year Book of Anaesthesia
11. Anaesthesia Clinics
12. Clinics in North America in Anaesthesiology

Chapter III

M. D. Aviation Medicine

Goals

The candidates are expected to attain high proficiency both in theoretical and practical aspects of Aerospace Medicine and other allied disciplines including recent advances.

The goals of postgraduate training course would be to train a MBBS doctor who will:

- Practice efficiently and effectively Aerospace Medicine backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education in the speciality irrespective of whether he/she is in a teaching institution or is a practicing specialist.
- Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion
- Demonstrate understanding of basic sciences relevant to this speciality
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the management of the case and to carry out this management effectively.

- Update oneself by self study and by attending courses, conferences and seminars relevant to the speciality.
- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform common procedures relevant to the speciality.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- Undertake complete monitoring of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

Brief outline

1. History of Aerospace Medicine.
2. Aeronautics including Aerodynamics and Principles of flight Navigation and aids, aeroengines.
3. High Altitude physiology including Hypoxia, Oxygen equipment, pressure breathing protective clothing, explosive decompression.
4. Acceleration physiology including Gravitational stress of different types and duration, Anti 'g' devices, simulated stress studies.

5. Cardiopulmonary physiology including of respiration, Haemodynamics, Regulatory mechanisms and functional assessment.
6. Environmental physiology including Thermal Stress, Thermal regulation and prevention of thermal effects.
7. Metabolic and Endocrinal physiology including Nutrition.
8. Neuro physiology including mechanism of sensory perception integration, reticular activation system, limbic system and Physiology of emotions.
9. Applied physics including acceleration forces vibration stress, impact and crash forces; Thermal stress, heat exchange mechanisms, Refrigeration, Atmospheric physics Radiation, Noise and Bio-Physics in relation to flying.
10. Bio-Medical engineering including principles of Biomechanics, Instrumentation and physiological monitoring systems and their applications. Familiarisation of Electromedical equipment in use in Aerospace environment.
11. Human Engineering including Anthropometry, cockpit and work station ergonomics, work load evaluation, instrument lay-out, escape systems, crash dynamics, investigation and survival.
12. Aeromedical Evaluation Techniques as applicable to civil and Military Aircraft and Aeromedical Equipment.
13. Aviation Ophthalmology including physiology of vision and colour vision, optics, refraction and optometry, visual problems in Aviation, Aeromedical evaluation of Ophthalmic disorders.
14. Aviation Otolaryngology including Noise stress and conservation of hearing, disorientation, vestibular functions and their assessment, vestibular habituation, otitic and sinus barotrauma.
15. Aviation Neuro Psychiatry including common Psychiatric disorders as encountered in Aviation Medicine practice and applied aspects of behavioral sciences.
16. Aviation Pathology including accident investigations, medicolegal aspect, post mortems collection and despatch of pathological specimens, accident reconstruction.
17. Aviation Toxicology including Yoxicology in relation to aircraft industry, aircraft operations and preventive measures.

18. Internal Medicine including common medical disorders in Aircrew, drugs and the Flier, Hyperbaric medicine, inflight medical emergencies,
19. Radiology including Radio Diagnosis and Assessment of Head, spinal and other skeletal injuries following accident; abnormalities of skeletal system.
20. Radio Diagnosis methods in cardiopulmonary, gastro-intestinal disorders, radiation hazards in Aviation Medical Evaluation investigation, diagnosis and disposal of medical surgical and other disabilities in Aircrew; Air Evacuation of casualties.
21. Fundamentals of Space Medicine, including life support systems, weightlessness, gravitational and thermal stress.
22. Medical statistics related to research and investigations in Aviation Medicine.

Detailed outline

Theory lectures and practicals/clinics (Figures denote No. of lectures)

AERONAUTICS

1. a) Principles of Flight

Streamline Airflow, Bernoulli's Theorem – IAS and Ground speed (2).

Total : 02

b) Aircraft Manoeuvres and Controls

Aircraft axes and controls. Control surfaces. Forces acting on an aeroplane in level flight, climb and dive (2)

Stability and control – High wing and low wing configuration – Sweep back lateral stability, Manoeuvres – Pitching, Yawing, Rolling – Aerobatics – Spin, Roll, Loop, Inverted Flight – Phenomenon of side slip – diving (3)

High Speed flight – Aerofoil and body shapes – shock, stall – introduction to power controls (3).

Total : 08

c) Aero Engines

Reciprocating engine, Familiarisation with parts of engines and their functioning (1).

Introduction to gas turbines. Centrifugal flow. Axial flow turbines.

Pulse jets, Ram jets (1)

Total : 02

d) Navigation

i) Principles of navigation

Flight plan – Ground speed and drift computation, correction of ETAS map reading and map marking. (2)

ii) Navigational and landing aids. Flight instrument for the navigators. Flight display information. (2)

Map and tools used by navigators. Aids to provide ground fixes. Landing system for bad weather. (2)

iii) Demonstration of navigational aids. (3)

e) Meteorology (2)

Visit to meteorology section. (2)

Total : 04

HAP DEPT

1. Theory Lectures

a) Respiratory Physiology in Flight

Atmosphere and acute altitude physiology, (1), Respiratory changes in flight situations (1), Concepts of respiratory physiology in Hypoxia (2), requirements of oxygen, tissue metabolism, Alveolar Oxygen tension and its determinants, oxygen cascade, PAO₂ with altitude; oxygen dissociation curve and altitude (2).

Total : 06

b) Acute Altitude Hypoxia

Hypoxia definition, classification, Hypoxia in flight, aetiology of hypobaric hypoxia (1), Respiratory response, breathing air, oxygen and during rapid decompression, physiological equivalent lung altitudes (4); Cardio vascular responses general and regional (1), Neurological effects of acute hypobaric hypoxia and performance changes (2), Clinical features and stages of Hypoxia (1), Factors affecting Hypoxia, prevention and acceptable limits of Hypoxia (2).

Total : 11

c) Prevention of Hypoxia

Oxygen concentration, flows, pressure and resistance (2), Pressure breathing; concepts, physiological changes on Respiratory and Cardio Vascular Systems (4), Pressure breathing assemblies (2).

Total : 08

d) Oxygen Systems

General requirements (1) Physiological requirements (2), Oxygen equipments (4) source, (LOX, GASOX, OBOGS), regulator and mask (2),

Passenger oxygen systems (1), Oxygen masks (2), Evaluation and testing of a/c oxygen system – MIL stds and specs (3).

e) Decompression sickness

Physiological considerations (3), Clinical signs and symptoms (2), factors affecting DCS (3), EVA and space station DCS (1).

Total : 09

f) Rapid Decompression

Physical and Physiological considerations (3), RD and Oxygen design and evaluation (1), Safety criteria and dangers (1).

Total : 09

g) Aeromedical Problems in High Altitude operations, Helicopter flying in India (1)

Total : 01

Symposia

h) Oxygen equipment in the IAF (4).

i) Recent advances in High Altitude Physiology – symposium (4).

j) HAP research in the IAF (4).

Hyperbaric Oxygen Therapy

Physiological considerations (3). HBO profiles clinical applications (2). HBO facilities (1). Oxygen toxicity (1), HBO in the IAF (1).

Total : 08

Space Medicine

Life Support System

a) Escape, Pressurisation, Oxygen system, Air Conditioning and Clothing in spacecraft and during EVA.

b) Management of waste products.

c) Selection of space crew and their medical evaluation.

d) Future concepts.

Total : 07

Practical

Decompression Chamber (10), Flying Clothing (15), Oxygen systems (06), Hyperbaric Oxygen (3).

Total : 35

ACCELERATION AND VETIBULAR PHYSIOLOGY

a) Spatial Disorientation

Historical perspective (1), Orientation mechanisms (2), Dynamics of SD (1), Statistics (1), Illusions (4), Prevention (1), New Concepts (1).

Total : 11

b) Acceleration

i) Historical perspective (1), Definitions, Magnitude, Direction (3), G-LOC (2), SACM (2), Anti G Valve (1), Anti G Suit (1), PBG (1).

ii) Cardiovascular changes

Circulation under gravitation system (2), Effects on the heart (1), Effects on Vision (1) Effects on cerebral circulation (1), Effects of straining manoeuvre on the cardiovascular system (1), Effects of Anti-G suit on CVS (1) Effects of PBG on CVS (1).

Total : 08

iii) Respiratory changes in Acceleration

Effects on ventilation (1), Effects on distribution of blood flow (1), Effects on gas exchange and oxygen saturation (1), Changes during PBG (1), changes during AGSM (1).

Total : 05

iv) Protection Vs Gz

Mechanical (1), Physiological (1), Centrifuge training (2)

Total : 04

v) -Gz (2)

Total : 02

vi) Gx (3)

Total : 03

Symposia

a) G-LOC (48)

- b) Advances in Gz Protection (4)
- c) Advances in SD Prevention (4)

Total : 12

Practical

Centrifuge (15), G-Suit (05).

Total : 20

HUMAN ENGINEERING

1. Scope, definition and introduction to Human Engineering (2).
2. **Control / Display Integration.** General criteria, position relationship, control display ratio etc (3).
3. **Visual Displays.** General trans illuminated displays, scale indicators, CRT / LCD displays, Newer displays – HUD, HMD, HMSD, HDD / Projected Map Display (3)
4. **Audio Displays.** General characteristics, Audio warnings, S/N relationship, verbal warning signals, speech transmission, reception, speech intelligibility (3)
5. **Controls.** General rotary controls, linear controls, high force controls, miniature control touch screen controls, fly by wire (3), fly by night.
6. **Anthropometry and Biomechanics.** Anthropometric data, special regions, dynamic conventional and digital anthropometry, posture and seating (4).
7. **Data Entry.** General, data display, interactive control, feedback, error-management and data protection, system response time (#).
8. **Work Space Design.** General, data standing operations seated operations, common working positions, standard console design, special purpose console design, ingress and egress (3), safety.
9. **Environment.** Heating, ventilation and air conditioning, illumination, acoustic noise, vibration (3).
10. **Human Factors In STOL / VTOL aircraft, Helicopters, ATC, Flight deck automation, Super Sonic Transport (2).**

11. **Maintenance and Ground Personnel.** Ladders and ramps, manual material handling, work / rest cycles, strength and endurance, lifting tasks, carrying tasks, reducing risk of overexertion. (3)
12. **Human Error, Hazard and Flight Safety.** General, types of human error, theories of accident causation, risk perception and warning. (4).
13. **Medical Evaluation of Operator Disabilities** (3)
14. **Historical Aspects** (1)
15. **Unassisted Escape** (2)
16. **Assisted Escape** (3)
17. **Ejection seat Design Concepts** (3) Ejection system in various IAF aircraft (4) Recent advances in ejection system (2), Injuries during ejection (4), Care and disposal of ejectees (2), Psychological problems in ejection (1).
18. **Space Shuttle** Cockpit environment, workspace layout, life support and survival equipment.
19. **Spinal Evaluation**
20. **Mental Workload** Assessment and Evaluation of Mental Workload in Aviation Environment.
21. **Aircraft accident investigation and reconstruction**

Total : 61

AVIATION SAFETY AND CREW PERFORMANCE

CRASH AND RESCUE

1. Airworthiness and crash worthiness (1)
2. Restraint systems (2)
3. General concepts of crash rescue set up (2)
4. Role of MO in crash and rescue (2)

Total : 07

SURVIVAL

5. General concepts (1)
6. Contents of survival pack (2)
7. Survival situations : snow, desert, jungle, sea (4)

Total : 07

CASUALTY AIR EVACUATION

8. Carriage of sick and disabled (2)
9. Cas-Evac capabilities of IAF aircraft (2)

Total : 04

Practicals

10. Static anthropometry (10)
11. Dynamic anthropometry and biomechanics (10)
12. Assessment of orthopaedic and spinal disabilities (05)
13. Gonimetry for assessment of joint motions (05)
14. Psychomotor performance test.

Total : 30

Demonstrations

15. Ejection seat pull out trials (3)
16. Types of ejection seat in IAF (3)
17. Personal Survival packs and their contents (2)
18. Cockpit Familiarisation (e.g. AirbusA-320) (2)
19. Cockpit vision inside and outside the cockpit (2)

Total : 12

CIVIL AVIATION MEDICINE

- a) Flight duty time limitation (2)
- b) Air Ports (2)
- c) Selection and training (2)
- d) Traffic and Approach (1)
- e) Aerial hygiene and sanitation (2)
- f) Airline catering (2)
- g) Carriage of sick and disabled (3)
- h) Epidemiological and Immunological problems (2)
- i) International health organisation (1)
- j) Civil air organisation in India (1)
- k) Role of Aviation Medicine Specialist in Civil Aviation (1)

Total : 19

PSYCHOLOGY

1. Introduction to Aviation Psychology : Role & Scope (1)
 - a) **Personality**
Theories of personality (2), Development of personality (1), Assessment of personality (1), Its application in aviation (1)
Total : 05
 - b) **Cognitive Process**
Attention (1), Perception (1), Memory (1), Decision making (1)
Total : 04
 - c) **Cognitive Abilities**
Intelligence (1) 6th abilities (1)
 - d) **Aircrew Selection**
Present method, work done at IAM and elsewhere to improve the system (1)
Total : 01
 - e) **Learning**
Principles of learning (1), Application in training (1)
Total : 02
 - f) **Emotions and motivation (1)**
Total : 01
 - g) **Stress**
Strategies enclosing with stress (2). Psychological stress in flying (2) Anxiety and its management (2), Various psychotherapies (2)
Total : 08
 - h) **Social Psychology in the flight deck environment**
Groups in aviation and group performance factors (2), Leadership styles and effective cockpit managers (2).
Total : 04

HUMAN FACTORS DIVISION

1. Role of MO in a/c accident at SSQ (2)
 2. Accident investigation procedure (4)
 3. Duties of medical member Board of Inquiry
 4. Flight Safety (2)
- Total : 16

BIO STATISTICS

1. a) **Descriptive Statistics.**
Role of statistics in medical research. Types of experimental data. Graphical Representation. Measures of Location. Measures of Variability. Percentiles (06)
Total : 06

b) **Relations and predictions of Variables.**

Correlation. Scatter Diagram. Karl Pearson's Correlation Coefficient. Rank Correlation Coefficient. Test of significance of an Observed Correlation Coefficient. Regression. Fitting of Linear Regression. Test for Linearity of regression. Extensions of Regression Problems. (06)

C) **Introduction to Significance Tests.**

Sample Size. Null Hypothesis. Level of significance. One tail & two tail tests. Degrees of Freedom. Standard Error. (06)

d) **Parametric Tests.**

Distribution of 'Z' Ratios – Testing of difference between the means of two large samples. Student 'T' Test : Paired 'T' test and unpaired 'T' test. Analysis of Variance- One-way classification Problems. Two-way classification Problems and General comments on analysis of variance. (06)

e) **Non –Parametric tests**

Chi-square test – Testing of Independence of attributes and Homogeneity of samples. Sign Test Wilcoxon Rank Sum Test (06)

Total : 30

GENERAL PHYSIOLOGY INCLUDING BIOCHEMISTRY

1. **General Aspect**

Homeostatic Mechanism (2). The control systems of the body (3)

Total : 05

2. **Cardiovascular System**

Physiological anatomy of the heart and the blood vessels (2). The heart as a pump : Cardiac muscle electromechanical properties. Electrical activation of the heart (2). Basis of EKG (3). Cardiac cycle, heart sounds (2). Cardiac output : measurement, control hemodynamics (2), Regulation of blood pressure, Microcirculation, regional circulations : cerebral coronary muscles skin. CVS responses to postural stress (4). CVS responses to exercise (1). Pathophysiology of congestive heart failure and circulatory shock (2)

Total : 18

3. **Respiratory Systems**

Physiology and anatomy of the systems. lung volume and capacities (1). Mechanics of breathing (2). Pulmonary function tests (1). Pulmonary dynamic spirometry (2). Gas laws, pulmonary ventilation (1). Pulmonary circulation, V/Q ratio, Diffusion of

respiration (2). Hyperventilation in flying (to be covered by HAP)> Acclimatisation to High Altitudes AMS, HAPO (2)

Total : 13

4. Thermal Stress

Significance of Thermal stress in Aviation (1), Principle of homeothermy, heat balance equation (1). Assessment of thermal stress, heat stress indices, cold stress indices (2) Physiology of thermoregulation heat responses, cold responses (2) Acclimatisation to thermal stress (1). Tolerance to ante heat (1). Effects of extremes of thermal stress heat disorders, cold injuries (1). Protective measures against thermal stress in aviation environment (2)

Total : 11

5. Central Nervous System

Physiology of sleep and arousal (2). Autonomic Nervous System (2) Sensory and motor mechanisms (1). Circadian rhythm (1), Neurotransmitters (1).

Total : 07

6. Renal Physiology

Significance in the field of aerospace medicine histological and permeability characteristics of nephron (2). Formation and concentration of Urine (2). Fluid & electrolyte balance (2). Acid base balance (2).

Total : 08

7. Endocrine

Mechanism of hormone action (1). Hypothalamo hypophyseal hormones (2) Thyroid (2). Adrenal gland and hypothalamo hypophyseal adrenal axis (2) Physiology of stress and stress markers (3).

Total : 10

8. Physiology of Ageing (4) & Physiology of Women in Aviation (4)

Total : 08

9. Biochemistry

(a) Metabolism

Energy metabolism (2) Carbohydrate metabolism (2) metabolism (2) Protein metabolism (2) Integration of metabolism (1)

Total : 09

(b) Nutrition (2)

General aspects (1). Aircrew nutrition and preflight meals (2)

Total : 05

10. Space Physiology

Cardiovascular changes in weightlessness. Acute induction, deconditioning (2).
 Skeletomuscular changes in weightlessness (2). Neurovestibular adaptation to weightlessness –Space Motion Sickness (1) Ground simulation of hypo-gravity (1)
 Countermeasures of preventing space deconditioning (1).

Total : 07

APPLIED PHYSICS**1. Atmospheric Physics**

Atmospheric physics in relation to flying (2)

2. Cabin Pressurisation

Cabin pressurisation and explosive decompression (1)

3. Acceleration

Types of acceleration in aviation and space (2)

4 Impact

Impact and impact protection (1)

Total : 06

5 Escape from Aircraft

Ejection forces, Ejection trajectory, Biodynamics of ejection, Acceleration overshoot, Parachute opening shock, Dynamic response index., Mechanical impedance., Survival pack testing

Total : 04

6 Thermal Stress

Modes of heat exchange, Heat Stress indices, Heat stress in an a/c cockpit, A/c cooling system.

Total : 02

7 Vibration

Vibration in aviation and aerospace, Measurement of vibration, Biodynamics of vibration, Effects of Vibration (1). Vibration exposure standard

Total : 02

8 Noise

Noise in aviation and aerospace, Noise measurement and analysis , Speech interference level, perceived noise and damage risk criteria

Total : 01

9 Illumination

Photometric parameters, Problems of illumination in flying, Testing of visors, goggles,

Total : 01

10 Radiation

Ionising radiation in aviation and aerospace, Microwave radiation, Laser and laser and laser safety (1)

Total : 02

11 Space

Space physics, Gravity, subgravity and weightlessness, Space Cabin.

Total : 01

AVIATION PATHOLOGY

Theory Lectures

1. Introduction and scope of Av Pathology (1)
2. Fatal aircraft accident investigation introduction and Medicolegal aspects (2)
3. Post mortem examination in fatal air crash and portable autopsy kit (2)
4. Collection, preservation and despatch of specimen (2)
5. Crash injuries – type, classification, causes analysis and prevention (2)
6. Timings of injuries including embolic phenomenon (2)
7. Histological finding and accident reconstruction (2)
8. Pre-existing disease and accident causation (2)
9. Role of aviation pathology in fatal aircraft accident investigation and analysis of autopsy finding and accident reconstruction (2).
10. Intoxication : Alcohol, CO etc (2)
11. Current techniques (2)
12. Identification of avian blood in aircraft accidents (2)

Total : 23

Practicals (Laboratory Tests)

1. Haematology
 - a) Haemoglobin estimation
 - b) Staining of blood smear and differential counts (6)
 - c) Total counts – WBC, RBC, Eosinophils and platelets
2. Urine Analysis (2)
3. Chemical Pathology
 - a) Blood sugar (including GTT and Glycosylated haemoglobin)
 - b) Blood urea and creatinine

- c) Cholesterol
- d) SGOT SGPT
- e) HPLC

4. Carboxy haemoglobin estimation (2)
5. Alcohol estimation/interpretation (2)
6. Demonstration of post mortem at CJAFB (4)
7. Collection, preservation and despatch of specimen (4)
8. Histological findings and accident reconstruction (6)
9. Role of aviation pathology in fatal aircraft accident investigation and analysis of autopsy finding and accident reconstruction (4)
10. Identification of avian blood in aircraft accident (4)
11. Clinical Pathology
 - a) Liver function tests
 - b) Renal function tests
 - c) Investigation for diabetes
 - d) Cardiovascular screening

Total : 48

MEDICINE

1. **ECG.** Biomedical Principles and Instrumentation (2), Physiological principles (2), Normal ECG and normal variants (2), Disorders of Conduction (2), Ischemic Heart Disease (2), Rhythm Disorders (2), Hypertrophy (2), Exercise Electrocardiography (2).

Total : 16

2. **Cardiovascular System.** Physical Examination of the Heart (2), Cardiovascular investigation (2), Radiology of the Heart and vessels (@), Ischemic Heart Disease (2), Hypertension (2), Heart failure (1), Cardiomyopathies (1), Valvular Heart Disease (2), Diseases of the Pericardium (1), Miscellaneous heart conditions (1), Congenital Heart Disease in Adults (1), Heart Disease in India and the IAF (1), Principles of Aeromedical disposal of CVS Disease (1), Recent Advances in CVS Diseases (1).

Total : 20

3. **Respiratory System.** Physical examination of the respiratory system (2), Investigation of the respiratory system (2), Radiology of the respiratory system (4), Bronchial Asthma (2), Upper respiratory disease (1), Disease of the Pleura (1), Pneumonias (1), Tuberculosis (1), Respiratory Disease in India and IAF (1); Aeromedical disposal of respiratory disease (1), Recent Advances (1).

Total : 17

4. **Central Nervous System.** Neurological Examination (2), Neurological Investigations (2), EEG (2), Radiology of the CNS (3), Epilepsy (1), Episodic Unconsciousness (1), Tropical Neurology (1), Common Neurological diseases of Aviation significance (2), Head Injuries (2), Recent Advances (1).

5. **Disease of the Spine and Fractures / Limb Injuries.** Functional muscle and spinal anatomy (4), Investigation of spinal disease (1), Radiology of the spine (2), Congenital Disorders of the spine (2), Traumatic disorders of the spine (2), Fractures principles and management (2), Upper limb fractures (1), Lower limb Fractures (1), Management of spinal injuries (2), Aeromedical disposal of spinal and limb injuries (2), Recent Advances (1).

Total : 20

6. **Gastroenterology and Hematology.** Functional anatomy and physiology of the GE and Biliary system (2), Investigation of GE and hepatic system (2), Radiology of GE and Liver (2), Common GE disorders of aviation significance (3), Viral hepatitis (2), Aeromedical disposal (2), Recent advances (1).

Total : 14

7. **Metabolic Disorders.** Endocrine anatomy and physiology (2), Investigation of Metabolic disorders (2), Thyroid disorders (1), Diabetes Mellitus (2), Obesity (1), Other endocrine disorders and aeromedical disposal (2), Recent advances (1).

Total : 11

8. **Renal Diseases.** Functional anatomy and physiology (1), Investigation of renal disease (1), Overview of renal diseases (2), Recent advances (1).

Total : 05

(In all medicine topics emphasis should be on Definition, Classification, Epidemiology of the disease in the world, India and IAF and Civil Aviation; Diagnosis; Prognosis and Disposal)

Total : 120

NEUROPSYCHIATRY

Theory Lectures

1. Psychiatry interview and history taking (1)
2. Personality disorders (1).
3. Alcohol and drug dependence (1).
4. Psychosexual disorders (1).
5. Neurosis (1)
 - a) Anxiety
 - b) Phobia
 - c) OCD
 - d) Somatoform disorders.
6. Mood disorders (1)
7. Schizophrenia disorders (1)
8. Paranoid states (1)
9. Suicidal behaviour (1)
10. Psychiatric emergencies (1)
11. Behaviour Therapy (1)
12. Aviation Related topics (2)
 - a) Head Injury
 - b) Air Sickness
 - c) Fear of flying
 - d) Alcohol and flyer
13. Somato/Pharmaco – Therapies (1)
14. Sleep Disorders (1)
15. Bio feedback and air sickness/stress disorders (1)
16. Aircrew Selection (1)

Total : 18

Clinics

1. Psychiatric case workup (2)
2. Anxiety Neurosis (2)
3. Depression (2)
4. Schizophrenia (2)
5. MDP (Mania) (2)
6. Alcoholism (2)
7. OCD / Phobia (2)
8. ECT Demonstration (2)
9. Hysteria (2)
10. Case taking (3)
11. EEG recording Demo (3)
12. Evoked Potentials (3)

Total : 27

OPHTHALMOLOGY

1. Anatomy and Physiology (applied) (1)
2. Binocular vision, Refraction (2) Ocular muscle balance – Physiology and testing (2) Visual Capacity (2)
3. Common eye disease (2) Laser (2) Contact and 10 lenses and aviation (2)
4. Visual problems in aviation (2)
5. Visual standard in civil and military aviation (1)
6. Glaucoma and its disposal for aircrew (2)
7. Classes of refraction error and other clinical in test (2)
8. Clinics (12)

Total : 32

OTOLARYNGOLOGY

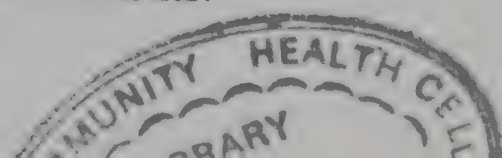
1. Review of applied anatomy and physiology (1)
2. Noise stress and conservation of hearing (2)
3. Vestibular physiology, function, assessment and habituation (2)
4. Disorientation (2)
5. Sinus and otitic barotrauma (1)
6. Aeromedical evaluation of ENT cases (1)
7. Otitis media – common ENT diseases, nasal allergy implications in aviation (1)
8. Deafness, Sensory neural hearing loss (1)
9. Smell & taste (1)
10. Speech intelligibility (1)
11. ENG (2)
12. ENT standards for aviation (1)
13. Clinics (12)

Total : 28

MEDICAL ELECTRONICS BIO MEDICAL ENGINEERING AND INSTRUMENTATION

1. Basics of electronic engineering: Diodes and transistors, Ics, amplifiers, types and characteristics – gain, range input impedance, output impedance, CMRR, band width etc., filters, signal conditioners. Power supplies, rectification, modulation and demodulation – AM and FM, telemetry – hardwire and radio, sample and hold ckts, mixers and multiplexes. Digitisation, ADC and DAC, digital ckts, flip flops, counters, memories, microprocessor fundamentals and computers. General Instrument system : Characteristics – linearity, frequency response, range, accuracy, precision etc., block diagram approach, matching blocks and impedances. Display devices and recorders : MC and MI instruments, CRT, video terminal, LED and LCD displays. Memories, tape storage, printers, chart recorders, x-y plotters, thermal, ink and laser printers, photographic and optical recorders. Aviation tolerant ckt design : circuit design for with-standing high G, vibration, low pressure and thermal environments.

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2. Transducers: Primary and secondary transducers, characteristics. Transducers for flow, displacement, temperature, rotation, level, pressure, acceleration, and rotation. R, L, C based transducers, strain gage, LVDT, carbon-dioxide and oxygen transducers, ultrasound transducers, optical, auditory and radiation transducers, radiation detectors and counters.
3. Neurological Instrumentation : EEG and EMG characteristics and recording, EEG machine, digital EEG, amplitude and frequency mapping, NCV – SNCV and MNCV, repetitive stimulation, F wave and H reflexes. Evoked potentials – BAER, AEP, VEP, SEP and CERA. CSF monitoring.
4. Instruments for behaviour : Instruments for cognition tests, GSR, BSR, bio-feedback – EMG, temp, EEG rhythm.
5. Instruments for long term monitoring : Multi-parameter monitoring, ICU, central station, holler monitoring of ECG and EEG, apnea and respiratory monitoring, CNS, sleep studies and pulse oxymetry.
6. Laboratory instrumentation: Auto Blood analysers, Ph meter, NMR and ESR spectroscopy, gas chromatography, spectro-photometer, fluorimeter, glucometer, HPLC etc.
7. Miscellaneous equipment : SW diathermy, electrocautery, ophthalmoscope, audiometer. Lasers in Aviation.
8. Electrical safety : Safety limits in electrical and medical equipment, isolation and grounding, IEC and BIS specification.
9. *Bioelectric potentials: Ionic and electronic potentials, Half cell and Nernst potentials, standard hydrogen electrode. Cell resting and action potentials, thresholds for stimulation, transmission of impulses in nerve and muscle. Sources of bioelectric potentials : ECG, EEG, EMG, ERG, EOG, ENG, EcochG and EGG – characteristics and ranges. Recording electrodes : Surface electrodes Ag / AgCl electrodes, needle electrodes, unipolar and bipolar electrodes.
10. Cardio-vascular instrumentation : ECG, Lead systems, electrical system of the heart, HR and ECG recorder, digital ECG and auto interpretation, stress test systems, cardiac assist devices, pacemakers, defibrillators, IABP, H/L machine and cath lab. Blood measurements : Blood pressure – invasive and noninvasive, viscosity, flow, cell counters and biochemical analysis systems, blood gas analysis.

11. Respiratory Instrumentation : Measurement of RR, flow, pressures, volumes etc. spirometry, ventilators – time, volume cycled and programmable, oxygenators, artificial lung and gas and vapour analysis.*

BIOMEDICAL ENGINEERING

Biomechanics : Scalars and vectors, forces and loads. Statics and dynamics, kinematics. Stress, strain, elasticity and Young's modulus. Creep, stress relaxation and viscoelasticity, Fluid flow mechanics – Bernoulli's theorem, viscosity, laminar and turbulent flow, Newtonian and non-newtonian fluids. Structural biomechanics, bone and joint biomechanics, spinal biomechanics.

**Classes to be taken by Department of Physiology

PREVENTIVE AND SOCIAL MEDICINE

1. Environment and Health (5)
Water pollution
Purification
Sanitation of Stations, Air crew Cafeterias
2. Occupational Health (3)
Noise prevention, Radiation, Vibration
Toxicology, Occupational hazards of ground crew
3. Health Education and Communication (2)
Principles, Content, Practice
4. N B C Warfare (3)
5. Non-Communicable Diseases (3)
Cancer, CAD, Obesity, Diabetes, Accidents
6. Research Methodology (2)
7. Family Welfare (1)
8. Immunisation (1)

Total : 20

Teaching / Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course.

Every candidates should undergo intensive practical training in the various sections of the concerned departments with a view to acquire adequate efficiency and technical skill in the speciality and also in the methods of organisation and administration of the departments.

Each year will be taken as a unit for the purpose of calculating attendance. Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. Lectures: Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) Didactic Lectures: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library
- 3) Research Methods
- 4) Medical code of Conduct and Medical Ethics
- 5) National Health and Disease Control Programmes
- 6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. Journal Club: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment. (See

Checklist in Chapter IV). A time table with names of the student and the moderator should be announced in advance.

3. **Subject Seminar:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be announced in advance.
4. **Ward Rounds:** Ward rounds may be service or teaching rounds.
 - a) **Service Rounds:** Postgraduate and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) **Teaching Rounds:** Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries (a) and (b) should be made in the Log book.

5. **Clinico-pathological Conference:** Recommended once a month for all post graduate Students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
6. **Inter Departmental Meetings:** Strongly recommended particularly at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.
7. **Teaching Skills:** The candidates will be required to participate in teaching and training programmes of under graduate students, interneers or housemen in their respective subjects by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. (See model check list Chapter IV). Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.
8. **Continuing Medical Education Programmes (CME) :** Recommended that at least 2 state level CME programmes should be attended by each student in 3 Years.
9. **Conferences:** Attending conferences is optional. However it is encouraged.

Dissertation

1. The candidates shall prepare a Dissertation (4 copies printed or typewritten) embodying the results of his personal work on an Aeromedical Problem. The work should aim at proving a solution to a problem or throw some light which will add to the existing knowledge. It may also suggest a new approach which will help ultimately in undertaking further study on the subject. The discussion contained in the Dissertation should be the candidate's own view based on logical conclusions drawn from his own results and that of others. References quoted in the dissertation should be arranged as per the international Practice. Statistical analysis of the results where indicated, shall always, be incorporated.
2. Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
3. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
4. Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
5. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.
6. The dissertation should be written under the following headings:
 - i. Introduction
 - ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion
 - vii. Conclusion
 - viii. Summary
 - ix. References (Vancouver style)
 - x. Table
 - xi. Annexures

7. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" × 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.
8. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.
9. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
10. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Rotation posting

OUT STATION VISITS

(Duration includes journey time)

1.	Naval Base (INS Hansa) Goa	4 days
2.	INS Viraat / INM Mumbai / Air India	1 week
3.	Air Force Academy / 2 AMTC / Indian Airlines	1 week
4.	Leh/Thoise	2 weeks
5.	DIPAS / INMAS / ETC	
		Total : 4 weeks 4 days

LOCAL VISITS / ATTACHMENTS

1. DEBEL : 2 Weeks attachment of 1 officer at a time
2. ASTE (6)
3. HAL (6)
4. CH (AF) Bangalore : Medicine : 2 months

Total : 12 weeks

NOTE:

In Departmental rotation time on Saturdays there will be Journal Club / Symposia after first 6 months. Clinics will be on wed / sat from 12 AM to 1 PM after 9 months.

Internal assessment important for Grading Exam will include Tests, Project work, Research potential, Teaching Potential and assessment of each HOD.

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills :* Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) *Dissertation in the Department :* Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another

before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book*- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Scheme of Examination

The examination shall consist of evaluation of dissertation, written paper (Theory), Practical/Clinical and Viva voce.

Dissertation: Every candidate shall carryout work and submit a dissertation as indicated in Sl.NO.9. Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

A. Written Examination (Theory)

A written examination shall consist of **four** question papers, each of **three** hours duration. Each paper shall carry 100 marks. Out of the **four** papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences. Recent advances may be asked in any or all the papers.

Paper I: Basic Sciences

1. Aeronautics including Aerodynamics and principles of flight, Navigation, Navigational aids and Aeroengines
2. Applied Physics including Atmospheric Physics, Cabin pressurisation, Acceleration forces, Vibration stress, Impact and Crash forces, Ejection trajectory analysis, Thermal stress, Refrigeration, Effects of Noise, Illumination, Optics and Radiation, Space physics.
3. Bio-medical engineering including Basics of Electronics, Instrumentation systems, principles of physiological monitoring systems and their application, biochemistry, familiarization of electromedical equipment in use in Aerospace Medicine, Electrical safety, elements of biomechanics - solid and fluid mechanics.
4. Medical statistics related to biomedical research - descriptive studies, relations and predictions of variables, parametric and non-parametric tests.
5. General physiology including cardiopulmonary physiology, mechanics of respiration, hemodynamics, regulatory mechanisms, functional assessment and ageing.
6. Metabolic and endocrinal biochemistry including bioenergetics and metabolism of carbo-hydrates, lipids, proteins and amino acids, enzymes used in clinical diagnostics, free radicals and nutrition.
7. Neuro-physiology including mechanics of sensory perception integration, reticular activating system, limbic system and physiology of emotions.

Paper II: Applied Physiology

1. High altitude physiology including respiratory physiology in flight, hypoxia an prevention, oxygen systems, decompression sickness, rapid decompression, aeromedical problems in high altitude operations, hyper baric oxygen medicine
2. Environmental physiology including thermal stress, thermal regulation and prevention of thermal effects.
3. Acceleration physiology including G-LOC, SACM, Anti-G suit, PBG, cardiovascular and respiratory changes during acceleration, protection against +Gz, effects of -Gz, Transverse and Lateral G.
4. Fundamentals of space physiology, simulation of micro G, conditioning, training and evaluation, life support systems, escape and survival, weightlessness, space sickness, countering gravitational and thermal stresses, vector cardiology in space environment, animal based experiments, extra vehicular activity in space and rescue.
5. Physiology of women in aviation

Paper III: History of Aerospace Medicine

1. History of Aerospace Medicine
2. Spatial Disorientation - static & dynamic, illusions, prevention, newer concepts.
3. Human engineering including ergonomics and anthropometry, spinal evaluation, cockpit design and instrument layout, cabin work station layout, workload studies, aids for vision enhancement, ejection and escape systems, survival aids - PSP, snow, land and sea survival, air casualty evacuation and disaster management, crash investigation.
4. Human factors in civil and military aviation, CRM, human errors, hazards and flight safety.
5. Design and aero-medical evaluation of flying clothing and life support systems as applicable to civil and military aircraft and aeromedical equipment.
6. Civil aviation medicine including flight duty timing limitations, traffic and approach, air hygiene and sanitation, catering, epidemiological and immunological problems, IHO, air ambulance and air hospitals.
7. Preventive and Social Medicine including environment and health, pollution - air and water, sanitation and purification, occupational health of air and ground crew, health education and communication, NBC warfare and protection, non-communicable diseases, family welfare and immunisation,

Paper IV: Clinical Aviation Medicine

1. Internal Medicine including cardiovascular, respiratory, nervous and renal systems, gastroenterology, hepatology and metabolic disorders, rheumatological disorders, common medical disorders in aircrew, drugs and the flier.
2. Aviation ophthalmology including physiology of vision and colour vision, optics, refraction and opometry, common eye diseases, visual problems in aeromedical evaluation of ophthalmic disorders.
3. Aviation otolaryngology including noise stress and conservation of hearing, vestibular functions, disorientation and their assessment, vestibular habituation, otitic and sinus barotraumas, deafness and sensory neural hearing loss, speech intelligibility.
4. Aviation neuro-physiology including psychosis and neurosis, personality disorders, alcohol and drug dependence, psychosexual disorders, suicidal behaviour, psychiatric emergencies, behaviour therapy, biofeedback, sleep disorders, aviation related topics- head injury, fear of flying and aircrew selection.
5. Aviation psychology including personality traits and assessment, aircrew selection, cognitive processes and abilities, principles of learning, stress management, motivation and applied aspects of behavioural sciences.
6. Aviation pathology and toxicology including collection, preservation and despatch of specimens, histological findings, accident reconstruction and investigation,

identification of avian blood in aircraft accidents, chemical pathology, haematology, clinical pathology.

7. Radiology including Radio Diagnosis and Assessment of Head, Neck, Spinal and other skeletal injuries following accident, abnormalities of skeletal system. Radio-diagnostic methods in Cardiopulmonary, Gastro-intestinal disorders, Radiation hazards in Aviation, Medical Evaluation including investigation, Diagnosis and disposal of medical, surgical and other disabilities in Aircrew.

B. Practical / Clinical Examination: 200 Marks

- i) Long case: one long case from any of the following departments : 50 marks
Medicine, Psychiatry, ENT, Eye and Orthopedics
- ii) Short Case: Two short cases from any of the following department: : 50 marks
Medicine, Psychiatry, ENT, Eye & Orthopedics
- iii) Aviation Practicals : 75 marks
- iv) Internal Assessment : 25 marks

C. Viva Voce

Viva Voce Examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 100 and the distribution of marks shall be as under:

(i) For examination of all components of syllabus 80 Marks

(ii) For Pedagogy 20 Marks

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

Recommended Books

See Page No.

LIST OF TEXT BOOKS

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SL NO	AUTHOR	TITLE	EDITION	YEAR OF PUBL.	PLACE	NAME OF PUBLISHER
I	ACCLERATION PHYSIOLOGY					
1.	David C Priston Barbara E Shapiro	Electromyography & Neuromuscular order, clinical electro physiology co-relation				
2.	Benno M Nigg and Walter Herzog	Bio-Mechanic of Muscular Skeletal System	2 nd			Wiley, University of Calicagara, Canada
3.	JA Gillies	Textbook of Aviation, Physiology		1965	Oxford	Pergamon Press
II	AVIATION PHYSICS					
1	John Ernsting & Peter	Aviation Medicine : Part I : The pressure Environment Part II : Biodynamics Part III: Thermal Stress and Survival	2 nd	1988		Butter worth
2.	John Ernsting, Anthony N Nicholson & David J Rainford	Aviation Medicine Part 1 : Aviation Physiology & aircrew Systems Part III : Operational Aviation Medicine	3 rd	1999		Butter worth- Heinemann

SL NO	AUTHOR	TITLE	EDITION	YEAR OF PUBL.	PLACE	NAME OF PUBLISHER
3.	Roy L DeHart	Fundamentals of Aerospace Medicine Section II : Physiology in the flight environment	2 nd	1996		Williams & Wilkins
4.	Michel Loeb	Noise & Human Efficiency		1986		John Wiley & Sons
	REFERENCES					
1.	Ed MJ Griffin	Handbook of Human Vibration		1990		Academic Press
2	Ed Gavriel Salvendy	Handbook of Human Factors and Ergonomics	2 nd	1997		John Wiley & Sons
3.		AGARD - Aero medical aspects of vibration and noise		1972		JC Guignard & PF King
III BIO-CHEMISTRY						
1.	Albert L Wchninger	Principles of Bio Chemistry	1 st Indian	1984	Delhi	CBS arrangement with Worth Publisher New York
2.	Smith EL, Hiee RL	Principles of Bio Chemistry Mammalian Bio Chemistry	Inter-national	1985	Singapore	McGraw-Hill Book
3.	Murray RK Granner PK	Harpers Bio Chemistry	25 th	2000	USA	Appleton & range, Connecticut 06855

SL NO	AUTHOR	TITLE	EDITION	YEAR OF PUBL.	PLACE	NAME OF PUBLISHER
4.	Kawleen Mohan & Sylvion Escott Shemp	Krause's' Food, Nutrition & diet therapy	10 th	2000	Philadelphia	WB Saunders Company-
5.	Antia & Abraham	Clinical Dietetics & Nutrition	4 th	1997	New Delhi	Oxford Uty Press
	JOURNAL					
1.		Aviation Space Environmental Medicine				
		Indian Journal of Medical Research				
		Indian Journal of Physiology & Pharmacology				
		Indian Journal of Bio Chemistry and Bio Physics				
IV BIO-MEDICAL ENGINEERING						
1.	Lislie Cormwell Fredj Weibell Erich A Pfeiffer	Bio-Medical Instrumentation & Measurement			New Delhi	PHI
2.	YC Fung	Fundamental of Bio Mechanics				
3.	Albert P Malvino	Electronic Principles			India	TMH
V ENGINEERING						
1.	Cornado	Aerodynamics				
2.	Jackclayn	Aerodynamics				Himalayan
3.	Pallet	Aircraft Instrumentation				

SL NO	AUTHOR	TITLE	EDITION	YEAR OF PUBL.	PLACE	NAME OF PUBLISHER
VI	ENT					
1	Alan G Keir	Scott Brown OTORHINOLARYNGOLOGY	6 th	1998	UK	Butter worth & CO
2.	Ballantyon Groovg	Synopsis of Scott Brown OTORHINOLARYNGOLOGY	5 th	1992	UK	Butter worth & CO
3.	Anivfan Biswas	Audio Vestibulometry	4 th	1998	India	
4		Clinics of North America Oto- Rhio Laryngology & Head & Neck	6 issues/year		USA	
5.		Acta Oto-Thio Laryngica	6 issues/year		Sweden	
6.		Indian Journal for Laryngology & Otology	Qtrly			
VII	HIGH ALLTITUDE	PHYSIOLOGY				
1.	AVM J Ernsting	Aviation Medicine	3 rd	1999	Oxford	Butter worth- Heinemann
2.	Roy L Dehart	Fundamentals of Aerospace Medicine	2 nd	1996	Baltimore	Williams & Wilkins
	REREFERENCE BOOKS & REPORTS					
1.	D Health & DR Williams	High Altitude Medicine and Pathology	4 th	1995	Oxford	Oxford University Press
2.	Ja Gillies	Textbook of Aviation Physiology	1 st	1965	Oxford	Pergamon Press

SL NO	AUTHOR	TITLE	EDITION	YEAR OF PUBL.	PLACE	NAME OF PUBLISHER
3.	G Oriani, A Marrani F Wattel	Handbook of Hyperbaric Medicine	1 st	1996	Springer Verlag	Berlin
4.	Enrico M Camporesi	Hyperbaric Oxygen Therapy : a Committee report		1996	Undersea & Hyperbaric Medical Society	
5.		Report by Undersea and Hyperbaric Medical Society Guidelines for Clinical Multiplace Hyperbaric facilities	1994		Undersea & Hyperbaric Medical Society	
6.	Michael P Ward , JS Miledge & JB West	High Altitude Medicine & Physiology	2ndd	1995	Chapman & Hall	Oxford
	JOURNALS					
1.		Undersea & Hyperbaric Medicine			Undersea & Hyperbaric Medical Society	
2.		Aviation, Space & Environmental Medicine			Aerospace Medical Association Alexandria	
VIII	HUMAN ENGINEERING					
1	Selvendy	Handbook of Human Factors & Ergonomics	2 nd	1997	USA	John Wiley & Sons Inc

SL NO	AUTHOR	TITLE	EDITION	YEAR OF PUBL.	PLACE	NAME OF PUBLISHER
2.	Mark S Sanders Ernest J Mc Cornik	Human Factors in Engineering & Design	7 th	1992	New York	
3.	Frank H Hawkins	Human Factors in Flight	First	1989	New Delhi	Himalayan Books
4.	Wesley E Woodson	Human Factors Design Hand Book	2 nd	1981	New York	McGraw-Hill
5.	Earl W Weiner David C Nagal	Human Factors in Aviation	First	1988	New York	Academic Press INC
IX	OPHTHALMOLOGY					
1	Kanski	Clinical Ophthalmology	IV	1999	London	Butter worth - Heinemann
2	SJH Miller	Parsons Diseases of the Eye	XVIII	1999	London	Butter worth - Heinemann
3	John Ernsting	Aviation Medicine	III	1999	Oxford	Butter worth - Heinemann
X	PHYSIOLOGY					
1	William F Ganong	Review of Medical Physiology	19 th	1999	Singapore	Appleton & Lange
2	Aurthur C Guyton & John E Hall	Text book of Medical Physiology	9 th	1996	Bangalore	Prism Book Ltd
3	Best & Taylor	Physiological Basis of Medical Practice	12th	1990	Baltimore, USA	Williams & Wilkins

SL NO	AUTHOR	TITLE	EDITION	YEAR OF PUBL.	PLACE	NAME OF PUBLISHER
XI	PSYCHIATRY					
1.	Sadock & Sadock	Comprehensive Textbook of Psychiatry	7 th	2000	Prithvi Stores Bangalore	Williams & Wilkins
2.	Vyas & Ahuja	Textbook of P.G Psychiatry	3 rd	2000	Prithvi Stores Bangalore	BI Churchill Livingston
3.		Indian Journal of Psychiatry Society	Qtrly		Indian Psychiatric Society	
XII	MEDICINE					
1.	Abramsky	Multiple Sclerosis				
2.	Aitkenetal	Behaviour science for Health professionals				
3.	Antman	Cardiovascular Therapists	2 nd			
4.	Baraitser	CA Clinical Genetics				
5.	Barrett	Text Immunology				
6.	Connaughton	Evidence Based Coronary case				
7.	Chirstopher Haslett	Davidson's Principles and practice of Medicine	18 th	1999	Edinburgh	Churchill Livingstone
8.	Ronald Bodley Scott	Prices Text book of Medicine	16 th	1998	Edinburgh	Oxford University Press
	JOURNAL					
1.		Indian Journal of Cardiology				

SL NO	AUTHOR	TITLE	EDITION	YEAR OF PUBL.	PLACE	NAME OF PUBLISHER
XIII	PSYCHOLOGY					
1.	Stanely Roscoe	Aviation Psychology		1980	Ames IA	Iowa State Uty Press
2.	Alan Stokes, Kristen Kite	Flight Stress: Stress Fatigue and Performance in Aviation		1994	Cambridge	Avebury
3.	Morgan CT, King Ra, Robinsons NM	Introduction to Psychology	7 th	1993	New Delhi	TMH
4.	Wiener EL, Nagel Dc	Human Factors		1988	New York	Academic Press Inc
	REFERENCE BOOKS					
1.	Hilgard CR, Atkinson RC Atkinson RL	Introduction to Psychology	6 th	1986	New Delhi	Oxford University
2.	Bernstein Roy, Srull, Wickens	Psychology	1991	Illinois	Houghton Mifflin Company	1262/-
3.	Carson RC, Butcher JN	Abnormal Psychology & Modern Life	9 th	1992	Harper Collins Publishers Inc	
4.	Anastasi Anee	Psychological Testing	6 th	1988	New York	Prentice Hall
5.	Mohanty GS	Aviation Psychology	3 rd	1990	New Delhi	Institute of Flight Safety
	JOURNALS					
1.		The international Journal of Aviation Psychology				Lawrence Erlbaum Associates Inc

Chapter III

Postgraduate Courses in Dermatology

M.D. Dermatology, Venereology and Leprosy

Goals

The goals of postgraduate training course would be to train a MBBS doctor who will:

- Practice efficiently and effectively, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education in the speciality irrespective of whether he is in a teaching institution or is a practicing specialist.
- Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion
- Describe common malignancies in the country and their management including prevention
- Demonstrate understanding of basic sciences relevant to this speciality
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Update oneself by self-study and by attending courses, conferences and seminars relevant to the speciality.
- Teach and guide his team, colleagues and other students.

- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform common procedures relevant to the speciality.
- Provide basic and advanced life saving support services (BLS) in emergency situations
- Undertake complete monitoring of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

The goal is to provide learning opportunities for acquisition of knowledge, human values and skills that may enable to diagnose and treat relevant diseases and disorders as a specialist.

Course Contents

1. Introduction, Historical aspects and Epidemiology
2. Comparative dermatology
3. Anatomy and organization of human skin
4. Functions of skin
5. Diagnosis of skin diseases
6. Histo-pathology of the skin-general principles
7. Inflammation
8. Clinical immunology and allergy
9. Genetics and geno-dermatoses

10. Prenatal diagnosis of skin disease
11. The Neonate
12. Naevi and other developmental defects
13. Pruritus
14. Eczema, Lichenification, Prurigo and Erythroderma
15. Atopic dermatitis
16. Contact dermatitis
17. Irritants and Sensitizers
18. Occupational dermatoses
19. Reactions to mechanical and thermal injury
20. Reactions to cold
21. Cutaneous photo-biology
22. Viral infections
23. Bacterial infections
24. Mycobacterial infections
25. Leprosy
26. Treponematoses
27. Mycology
28. Parasitic infestations and Protozoa
29. Diseases caused by Arthropods and other Noxious substances
30. Disorders of keratinization
31. Psoriasis
32. Epidermal skin tumours
33. Tumours of the skin appendages
34. Melanocytic Naevi and Malignant melanoma
35. Disorders of skin colour
36. Bullous eruptions
37. Lichen planus and Lichenoid disorders
38. Disorders of the sebaceous glands
39. Disorders of sweat glands
40. Disorders of connective tissue
41. Disorders of blood vessels
42. Rosacea, Flushing, and perioral dermatitis
43. Urticaria
44. Purpura
45. Cutaneous vasculitis
46. Diseases of the veins and arteries including leg ulcers
47. Disorders of lymphatic vessels
48. Noorobiotic disorders
49. Histiocytoses
50. Mastocytoses
51. Soft tissue tumours
52. Cutaneous lymphocytic infiltrates and Pseudolymphomas

53. Lymphomas and Leukaemias
54. Subcutaneous fat
55. The Connective tissue diseases
56. Metabolic and Nutritional disorders
57. Sarcoidosis
58. Systemic diseases and the skin
59. Reiter's disease
60. Skin and the nervous system
61. Psychocutaneous disorders
62. Disorders of nails
63. Disorders of hair
64. The skin and the eyes
65. The External ear
66. The Oral cavity
67. The Lips
68. The Breast
69. The Umbilical, Perianal and Genital Regions
70. Racial influences and skin disease
71. The ages of man and their dermatoses
72. General aspects of treatment
73. STDs
74. HIV infection & AIDS
75. Cutaneous drug eruptions
76. Dermato - Pharmacology
77. Dermato-surgery
78. Lasers in Dermatology

NOTE: Candidates are expected to be well versed in histopathology of all diseases.

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. **Lectures** : Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) **Didactic Lectures** : Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library,
- 3) Research Methods
- 4) Medical code of Conduct and Medical Ethics
- 5) National Health and Disease Control Programmes
- 6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) **Integrated Lectures** : These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. **Journal Club** : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A time table with names of the student and the moderator should be announced at the beginning of every year.

3. **Subject Seminar** : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.

4. **Student Symposium** : Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.

5. **Ward Rounds**: Ward rounds may be service or teaching rounds.

a) **Service Rounds**: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.

b) **Teaching Rounds** : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries of (a) and (b) should be made in the Log book.

6. **Clinical Case Presentations:** Minimum of 5 cases to be presented by every candidate each year. They should be assessed using check lists and entries made in the log book
7. **Clinico-Pathological Conference:** Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
8. **Inter Departmental Meetings:** Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology : A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of Surgery department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histo-chemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.
9. **Teaching Skills:** Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. (See model check list in Chapter IV). Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.
10. **Continuing Medical Education Programmes (CME) :** Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.
11. **Conferences :** Attending conferences is optional. However, it is encouraged.

Dissertation

1. Every candidate pursuing degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
2. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent

advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

3. Every candidate shall submit to the Registrar (Academic), RGUHS, in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
4. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.
5. The dissertation should be written under the following headings:
 - i. Introduction
 - ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion
 - vii. Conclusion
 - viii. Summary
 - ix. References (Vancouver style)
 - x. Tables
 - xi. Annexures
6. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.
7. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.
8. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
9. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Rotation Postings

This is essential to acquire knowledge in allied subjects as applicable to Dermatology, S.T.D. and Leprosy. It is preferable to post P.G. students to General Medicine, Paediatrics, Plastic Surgery and Psychiatry – 4 weeks each and posting to a Leprosy hospital or National Leprosy control units for 8 weeks.

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) **Personal Attitudes.** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) **Acquisition of Knowledge :** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The

assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills :* Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) *Dissertation in the Department :* Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book*- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

A. Theory

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows.

Paper I	Basic Sciences as applied to Dermatology, STD., and Leprosy
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Paper II	Dermatology	- 100
Paper III	S.T.D. & Leprosy	- 100
Paper IV	Dermatoloy in relation to Other Systemic Diseases	- 100

Note: The distribution of chapters / topics shown against the papers are suggestive only.

B. Clinical: 200 marks

1 Long case (Dermatology)	70 marks
2 Short cases (1 each of STD & Leprosy)	35 marks 35 marks
10 spotters (Different verities of cases included)	60 marks

C. Viva Voce: 100 marks

1) Viva-Voce Examination: (80 Marks)

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, for interpretation. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 Marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

D.

Maximum marks for M.D. degree course	Theory	Practical	Viva	Grand Total
	400	200	100	700

Recommended books and Journals

1. Wilkinson/Ebling, Text Book of Dermatology, 4 Volumes, 5th Ed. 1998, Oxford Blackwell Scientific Publications, London.
2. Samuel L. Moschela M.D. Harry J. Hurlly M.D., Text Book of Dermatology 2 Volumes – 2nd (Latest Edition 1994), 1985 First Indian Edition 1987, Jaypee Brothers, New Delhi.
3. Walter – F. Lever Gundula Schaumburg Lever, Histopathology o the Skin – 7th (Latest Edition 1996), 1990, J.B. Lippincott Company, Philadelphia Grand Rapids New York.
4. Iadvl Indian Association of Dermatologists Veneraeologiste & Leproligists, Text Book Atlas of Dermatology 2 Volumes – Ist Edition, 1994, Bhalani Publishing House, Dadar, Mumbai.

5. I Larry L, Arnold Richard 13-Dom William D. James, Andrew's Diseases of the Skin 1 Volume – 8th Edition, 1990, W.B. Saun Philedelphiader's company.
6. Satish S. Savant, Radha Atalshah, Deepak Gore, Text Book & Atlas of Dermato Surgery & Cosemetology – 1st Edition, 1998, ASCAD, Mumbai (Association of Indian Scientific Cosmetology and Dermatosurgey).
7. Richard Ashion, Barbara Lepdard, Differential Diagnosis in Dermatology – 2nd Edition 1992, Radchiffe Medical Press, Oxford.
8. Dharmendra, Leprosy 2 Volumes – 1st Edition 1985, Samant and Company, Mumbai.
9. Champion, R.H. Pye, R.J., Recent Advances in Dermatology 8th Volumes – 1st (8th) Edition 1990, Churchill Living Stone, London.
10. Amborse King Claude Nicol Philip Rodin, Venereal Diseases – 4th Edition 190 Reprinted 1984, 1986, ELBS English Language Book Society/Baillere Tindall, East Sussex.
11. R.S. Morton and J.R.W. Harris, Recent Awances in Std – 1st Edition 1975, Churchill Livingstone, London.
12. Hugh Wansey Bayly, Venerral Diseases – 3rd Edition, Buttreworth & Company, Bombay.
13. Jarnus Marshall, Diseases – 2nd Edition 1948, Mc Millan & Co, London
14. Parish L.C., Std – 2nd Edition 1989, Spring erlag, New York London.
15. King K Holmes, Sexually Transmitted Diseases – 3rd Edition (Latest) 1999, Mc Graw-Hill – Helath profession Division, New Delhi, \$ 129.00, Rs. 5688.90
16. Jopin W.H, Hand Book of Leprosy – 3rd Edition, 1984, William Hethgunah Medical Book Ltd., London.
17. Dermatology in General Medicine by Thomas B. Fitzpatrick McGraw Hill Book Company.

Journals

1. Archives or Dermatology
2. British Journal or Dermatology
3. Indian Journal or Dermatology
4. Indian Journal or Dermatology and Leprosy
5. Indian Journal or Leprosy
6. Journal of American Academy of Dermatology
7. International Journal of Dermatology
8. International Journal of STD & AIDS

Diploma in Dermatology, Venereology and Leprosy (D.D.V.L.)

Goal

The goal is to provide learning opportunities for acquisition of knowledge, human values and skills that may enable to diagnose and treat relevant diseases and disorders as a specialist.

The postgraduate training course would aim to train a MBBS doctor who will:

- Practice efficiently and effectively, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education .
- Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion
- Describe common malignancies in the country and their management including prevention
- Demonstrate understanding of basic sciences relevant to this specialty
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.

- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Update oneself by self-study and by attending courses, conferences and seminars relevant to the specialty.
- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform common procedures relevant to the specialty.
- Provide basic and advanced life saving support services (BLS) in emergency situations
- Undertake complete monitoring of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

1. Introduction, Historical aspects and Epidemiology
2. Comparative dermatology
3. Anatomy and organization of human skin
4. Functions of skin
5. Diagnosis of skin diseases
6. Histo-pathology of the skin-general principles
7. Inflammation
8. Clinical immunology and allergy

9. Genetics and geno-dermatoses
10. Prenatal diagnosis of skin disease
11. The Neonate
12. Naevi and other developmental defects
13. Pruritus
14. Eczema, Lichenification, Prurigo and Erythroderma
15. Atopic dermatitis
16. Contact dermatitis
17. Irritants and Sensitizers
18. Occupational dermatoses
19. Reactions to mechanical and thermal injury
20. Reactions to cold
21. Cutaneous photo-biology
22. Viral infections
23. Bacterial infections
24. Mycobacterial infections
25. Leprosy
26. Treponematoses
27. Mycology
28. Parasitic infestations and Protozoa
29. Diseases caused by Arthropods and other Noxious substances
30. Disorders of keratinization
31. Psoriasis
32. Epidermal skin tumours
33. Tumours of the skin appendages
34. Melanocytic Naevi and Malignant melanoma
35. Disorders of skin colour
36. Bullous eruptions
37. Lichen planus and Lichenoid disorders
38. Disorders of the sebaceous glands
39. Disorders of sweat glands
40. Disorders of connective tissue
41. Disorders of blood vessels
42. Rosacea, Flushing, and perioral dermatitis
43. Urticaria
44. Purpura
45. Cutaneous vasculitis
46. Diseases of the veins and arteries including leg ulcers
47. Disorders of lymphatic vessels
48. Noorobiotic disorders
49. Histiocytoses
50. Mastocytoses
51. Soft tissue tumours

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|-----|---|------------------------------|
| 52. | Cutaneous lymphocytic infiltrates and Pseudolymphomas | |
| 53. | Lymphomas and Leukaemias | |
| 54. | Subcutaneous fat | |
| 55. | The Connective tissue diseases | |
| 56. | Metabolic and Nutritional disorders | |
| 57. | Sarcoidosis | |
| 58. | Systemic diseases and the skin | |
| 59. | Reiter's disease | |
| 60. | Skin and the nervous system | |
| 61. | Psychocutaneous disorders | |
| 62. | Disorders of nails | |
| 63. | Disorders of hair | |
| 64. | The skin and the eyes | |
| 65. | The External ear | |
| 66. | The Oral cavity | |
| 67. | The Lips | |
| 68. | The Breast | 74. STDs |
| 69. | The Umbilical, Perianal and Genital Regions | 75. HIV infection and AIDS |
| 70. | Racial influences and skin disease | 76. Cutaneous drug eruptions |
| 71. | The ages of man and their dermatoses | 77. Dermato-Pharmacology |
| 72. | General aspects of treatment | 78. Dermato-Surgery |
| 73. | Dermatology in relation to systemic diseases | 79. Lasers in Dermatology |

NOTE:

1. Candidates are expected to be well versed in histopathology of all diseases.
2. D.V.D Candidates need not know immunological aspects of the diseases in detail unlike M.D. candidates. In individual diseases, stress is not laid on histopathological aspects for D.V.D. However, they should know the microscopical appearance of *Sarcoptes scabiei* and house fly; histopathology of few common skin diseases like Psoriasis, Lichen planus, Molluscum contagiosum, warts, Squamous cell neurofibroma and all types of Leprosy.
3. D.V.D. candidates need to know few epidermal tumours like seborrheic keratosis, kereto-acanthoma, epidermal cysts and common tumours of skin appendages.
4. D.V.D. candidates are expected to know commonly occurring syndromes.

Method of Training

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance. Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. **Lectures** : Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) *Didactic Lectures*: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library,
- 3) Medical code of Conduct and Medical Ethics
- 4) National Health and Disease Control Programmes
- 5) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. **Journal Club** : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least five times a year and a total of ten seminar presentations in two years. The presentations would be evaluated using checklists and would carry weightage for satisfactory completion of the course (See Checklist in Chapter IV).

3. **Subject Seminar**: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least five times a year and a total of ten seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for satisfactory completion of the course.

4. **Student Symposium**: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.

5. **Ward Rounds**: Ward rounds may be service or teaching rounds.

- a) *Service Rounds*: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.

- b) *Teaching Rounds* : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries of (a) and (b) should be made in the Log book.

6. **Clinico-Pathological Conference:** Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
7. **Clinical case presentations:** Candidates should periodically present cases, which will be assessed by using check lists (see Checklist in Chapter IV). Weekly clinical presentation and discussion -minimum of 5 per candidate per year
8. **Inter Departmental Meetings:** Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of department.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

9. **Continuing Medical Education Programmes (CME)** : Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.
10. **Conferences:** Attending conferences is optional. However, it is encouraged.

Rotation Postings

This is essential to acquire knowledge in allied subjects as applicable to Dermatology, S.T.D. and Leprosy. It is preferable to post P.G. students to General Medicine, Paediatrics, Plastic Surgery and Psychiatry – 4 weeks each and posting to a Leprosy hospital or National Leprosy control units for 4 weeks.

P.G. students to attend Basic Sciences departments like Anatomy, Physiology and Biochemistry.

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning

activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include: (i) Personal Attitudes, (ii) Acquisition of Knowledge, and (iii) Clinical and operative skills.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trustworthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by

using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) *Clinical skills*

Day-to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Periodic tests:*

The departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book-* Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records:* Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

A. Theory

There shall be three question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I	Includes Basic Sciences of Dermatology, STD and Leprosy	100
Paper II	Dermatology including systemic diseases	100
Paper III	STD and Leprosy	100

Note: The distribution of chapters / topics shown against the papers are suggestive only.

B. Clinical : Marks shall be 150.

Type of cases	
Long case (Dermatology)	50
2 Short cases (1 each of STD and Leprosy)	25 25
10 spotters (Varieties of cases included)	50

C. Viva Voce: 50 Marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, dummies, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, etc., for interpretation.

D.

Maximum marks for Diploma course.	Theory	Practical	Viva	Grand Total
	300	150	50	500

Recommended books and Journals

Books

1. Wilkinson/Ebling, Text Book of Dermatology, 4 Volumes, 5th Ed. 1998, Oxford Blackwell Scientific Publications, London.
2. Samuel L. Moschela M.D. Harry J. Hurlay M.D., Text Book of Dermatology 2 Volumes – 2nd (Latest Edition 1994), 1985 First Indian Edition 1987, Jaypee Brothers, New Delhi.
3. Walter – F. Lever Gundula Schaumburg Lever, Histopathology of the Skin – 7th (Latest Edition 1996), 1990, J.B. Lippincott Company, Philadelphia Grand Rapids New York.
4. Indian Association of Dermatologists Veneracologists & Leprologists, Text Book Atlas of Dermatology 2 Volumes – 1st Edition, 1994, Bhalani Publishing House, Dadar, Mumbai.
5. Harry L. Arnold Richard D. James, Andrew's Diseases of the Skin 1 Volume – 8th Edition, 1990, W.B. Saunders Philadelphia's company.
6. Satish S. Savant, Radha Atalshah, Deepak Gore, Text Book & Atlas of Dermato Surgery & Cosmetology – 1st Edition, 1998, ASCAD, Mumbai (Association of Indian Scientific Cosmetology and Dermatosurgery).
7. Richard Ashion, Barbara Lepdard, Differential Diagnosis in Dermatology – 2nd Edition 1992, Radcliffe Medical Press, Oxford.
8. Dharmendra, Leprosy 2 Volumes – 1st Edition 1985, Samant and Company, Mumbai.
9. Champion, R.H. Pye, R.J., Recent Advances in Dermatology 8th Volumes – 1st (8th) Edition 1990, Churchill Living Stone, London.
10. Ambrose King Claude Nicol Philip Rodin, Venereal Diseases – 4th Edition 190 Reprinted 1984, 1986, ELBS English Language Book Society/Baillere Tindall, East Sussex.
11. R.S. Morton and J.R.W. Harris, Recent Advances in STD – 1st Edition 1975, Churchill Livingstone, London.
12. Hugh Wansey Bayly, Venereal Diseases – 3rd Edition, Butterworth & Company, Bombay.
13. Jarnus Marshall, Diseases – 2nd Edition 1948, Mc Millan & Co, London

14. Parish L.C., Std – 2nd Edition 1989, Spring erlag, New York London.
15. King K Holmes, Sexually Transmitted Diseases – 3rd Edition (Latest) 1999, Mc Graw-Hill – Helath profession Division, New Delhi, \$ 129.00, Rs. 5688.90
16. Jopin W.H, Hand Book of Leprosy – 3rd Edition, 1984, William Hethgunah Medical Book Ltd., London.
17. Dermatology in General Medicine by Thomas B. Fitzpatrick McGraw Hill Book Company.

Journals

1. Archives or Dermatology
2. British Journal or Dermatology
3. Indian Journal or Dermatology
4. Indian Journal or Dermatology and Leprosy
5. Indian Journal or Leprosy
6. Journal of American Academy of Dermatology
7. International Journal of Dermatology
8. International Journal of STD & AIDS

Chapter III

M. D. General Medicine

Goal:

The postgraduate education is intended to produce a well informed, well trained doctor in medicine who is able to take care of patients, understand the essence of modern medicine, scrutinise the published literature while maintaining acceptable standards in discipline. It is expected that during to tenure of the course he develops optimum communication skills. The postgraduate education exposes the student to not only to Internal medicine, but also to other well established departments and sub specialities and allied subjects. The staff of all these departments will be involved in the PG programme. A well-motivated and monitored student is the key to the success of this programme.

The clinical rotation is intended to provide opportunity to post graduate student (PG) to the patient care and hands on experience. He/She is expected to acquire skills to be competent clinician in General Medicine. Most importantly, learn to formulate diagnosis, plan diagnostic procedures / investigations and plan rational therapy. Meticulous documentation of patients medical record by PG is encouraged. During this time PG is encouraged to learn the art of lengthy as well as brief presentations.

The PG is rotated through the subspeciality departments during second year of the three years course. This roster is provided to PGs at the entry to the course. One faculty member should be selected by the department and he/she should act as friend, guide, counselor and philosopher for PG throughout the training course.

The medical post graduate after completion of MD (Gen. Med.) should be able to manage patient independently as a specialist. He should be able to plan and carry out research activity in the field of General Medicine. He should be able to teach under graduate medical student subject of General Medicine.

Objectives:

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion
- Describe common malignancies in the country and their management including prevention
- Demonstrate understanding of basic sciences relevant to this speciality
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Update oneself by self-study and by attending courses, conferences and seminars relevant to the speciality.
- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform common procedures relevant to the speciality.
- Provide basic and advanced life saving support services (BLS) in emergency situations
- Undertake complete monitoring of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

The goal is to provide learning opportunities for acquisition of knowledge, human values and skills that may enable to diagnose and treat relevant diseases and disorders as a specialist.

Course Contents:**Theory:**

INTRODUCTION TO CLINICAL MEDICINE: The practice of medicine – ethical issues in clinical medicine – quantitative aspects of clinical reasoning – host and disease: influence of demographic and socioeconomic factors – influence of environmental and occupational hazards on disease – women's health – medical disorders during pregnancy – adolescent health problems – geriatric medicine – principles of disease prevention – cost awareness in medicine.

***CARDINAL MANIFESTATIONS AND PRESENTATION OF DISEASES:**

*PAIN – pathophysiology and management – chest discomfort and palpitation – abdominal pain – headache – back and neck pain *ALTERATIONS IN BODY TEMPERATURE: fever and hyperthermia – fever and rash – hypothermia *NERVOUS SYSTEM DYSFUNCTION: faintness, syncope, dizziness, and vertigo – weakness, abnormal movements, and imbalance – episodic muscle spasms, cramps and weakness – numbness, tingling and sensory loss – acute confusional states and coma – aphasia and other focal cerebral disorders – memory loss and dementia disorders of sleep and circadian rhythms.

DISORDERS OF THE EYES, EARS, NOSE AND THROAT – disorders of the eye disorders of smell, taste and hearing – infections of the upper respiratory tract- oral manifestations of disease.

ALTERATIONS IN CIRCULATORY AND RESPIRATORY FUNCTIONS – dyspnea and pulmonary edema – cough and hemoptysis – approach to the patient with a heart murmur – approach to the patient with hypertension – hypoxia, polycythemia and cyanosis – edema – shock – cardiovascular collapse, cardiac arrest, and sudden cardiac death.

ALTERATIONS IN GASTROINTESTINAL FUNCTION – dysphagia, nausea, vomiting and indigestion – diarrhea and constipation – gain and loss in weight – gastrointestinal bleeding – jaundice – abdominal swelling, ascites.

ALTERATIONS IN URINARY FUNCTION AND ELECTROLYTES – cardinal manifestations of renal disease – voiding dysfunction, incontinence, and bladder pain – fluid and electrolyte disturbances – acidosis and alkalosis.

ALTERATIONS IN THE UROGENITAL TRACT – impotence – disturbances of menstruation and other common gynecologic complaints in women – hirsutism and virilization.

ALTERATION IN THE SKIN – approach to the patient with skin disorders – eczema, psoriasis, cutaneous infections, acne, and other common skin disorders – cutaneous drug reactions – skin manifestations of internal disease – photosensitivity and other reactions to light.

Hematological alterations – anemia – bleeding and thrombosis – enlargement of lymph nodes and spleen – disorders of granulocytes and monocytes.

MANIFESTATIONS OF CANCER – presentations of the patient with cancer: solid tumors in adults-evaluation of breast masses in men and women.

GENETICS AND DISEASE – genetics and disease – cytogenetic aspects of human disease – treatment and prevention of genetic disease.

CLINICAL PHARMACOLOGY – principles of drug therapy – adverse reactions to drugs – physiology and pharmacology of the autonomic nervous system – nitric oxide biologic and medical implications.

NUTRITION – nutrition and nutritional requirements – assessment of nutritional status – protein and energy malnutrition – obesity – anorexia nervosa and bulimia nervosa – diet therapy – enteral and parenteral nutrition therapy – vitamin deficiency and excess – disturbances in trace elements.

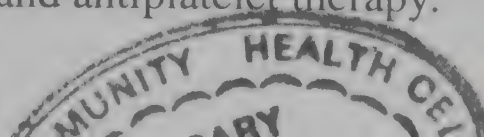
ONCOLOGY AND HEMATOLOGY NEOPLASTIC DISORDER – approach to the patient with cancer – prevention and early detection of cancer – cell biology of cancer – cancer genetics – invasion and metastasis – principles of cancer therapy – infections in patients with cancer – melanoma and other skin cancers-head and neck cancer – neoplasms of the lung – breast cancer – gastrointestinal tract cancer – tumors of the liver and biliary tract – pancreatic cancer - endocrine tumors of the gastrointestinal tract and pancreas – bladder and renal cell cancer – hyperplasia and carcinoma of the prostate – testicular cancer – gynecologic malignancies – sarcomas of soft tissue and bone – metastatic cancer of unknown primary site – paraneoplastic syndromes – paraneoplastic neurologic syndromes – oncologic emergencies.

DISORDERS OF HEMATOPOIESIS – hematopoiesis – iron deficiency and other hypoproliferative anemias disorders of hemoglobin – megaloblastic anemias – hemolytic anemias and acute blood loss – aplastic anemia and myelodysplasia – polycythemia vera and other myeloproliferative diseases – acute and chronic myeloid leukemias – malignancies of lymphoid cells- plasma cell disorders transfusion biology and therapy – bone marrow transplantation.

DISORDERS OF HEMOSTASIS – disorders of the platelet and vessel wall – disorders of coagulation and thrombosis – anticoagulant, fibrinolytic, and antiplatelet therapy.

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INFECTIOUS DISEASES – BASIC CONSIDERATIONS IN INFECTIOUS DISEASES – Introduction to infectious diseases: host parasite interaction – laboratory diagnosis of infectious diseases – immunization principles and vaccine use – health risks to travellers *CLINICAL SYNDROMES – COMMUNITY ACQUIRED – sepsis and septic shock – fever of unknown origin – infective endocarditis – intraabdominal infections and abscesses – acute infectious diarrhoeal diseases and bacterial food poisoning – sexually transmitted diseases: overview and clinical approach – pelvic inflammatory disease – urinary tract infections and pyelonephritis – osteomyelitis – infections of the skin, muscle, and soft tissues – infections (excluding AIDs) in injection drug users – infections from bites scratches and burns *CLINICAL SYNDROMES – NOSOCOMIAL INFECTIONS infections in transplant recipients – hospital – acquired and intravascular device – related infections – infection control in the hospital *BACTERIAL DISEASES: general considerations – molecular – mechanisms of bacterial pathogenesis – treatment and prophylaxis of bacterial infections *DISEASES CAUSED BY GRAM-POSITIVE BACTERIA – pneumococcal infections – staphylococcal infections – streptococcal and enterococcal infections – diphtheria, other corynebacterial infections, and anthrax – infections caused by listeria monocytogenes – tetanus – botulism – gas gangrene, antibiotic – associated colitis, and other clostridial infections *DISEASES CAUSED BY GRAM – NEGATIVE BACTERIA – meningococcal infections – gonococcal infections – moraxella (branchamella) catarrhalis other moraxella species and kingella – infections due to haemophilus influenzae, other haemophilus species, the hACEK group, and other gram – negative bacilli – legionella infection – pertussis diseases caused by gram – negative enteric bacilli – helicobacter infections – infections due to pseudomonas species and related organisms – salmonellosis – shigellosis- infections due to campylobacter and related species – cholera and other vibrios - rucellosis – tularemia – plague and other yersinia infections – bartonella infections, including cat – scratch disease – Donovanosis (granuloma inguinale)

*MISCELLANEOUS BACTERIAL INFECTIONS – nocardiosis – actinomycosis – infections due to mixed anaerobic organisms *MYCOBACTERIAL DISEASES – antimycobacterial agents – tuberculosis – leprosy (hansen's disease) – infections due to nontuberculous myco bacteria *SPIROCHAETAL DISEASES – syphilis – endemic treponematoses – leptospirosis – relapsing fever – lyme borreliosis *RICKETTSIA, MYCOPLASMA AND CHLAMYDIA – rickettsial diseases – mycoplasma infections – chlamydial infections *VIRAL DISEASES – medical virology – antiviral chemotherapy *DNA VIRUSES – herpes simplex viruses – varicella – zoster virus infections – epsteinbarr virus infections, including infectious mononucleosis – cytomegalovirus and human herpesvirus types 6, 7 and 8 – smallpox, vaccinia and other poxviruses – parvovirus – human papillomavirus infections *DNA AND RNA RESPIRATORY VIRUSES – common viral respiratory infections *RNA VIRUSES – the human retroviruses – influenza – viral gastroenteritis – enteroviruses and reoviruses – measles (rubeola) – rubella (german measles) – mumps – rabies virus and other rhabdoviruses –

infections caused by arthropod and rodent – borne viruses – marburg and ebola viruses (filoviridae) *FUNGAL INFECTIONS – diagnosis and treatment of fungal infections – histoplasmosis – coccidioidomycosis – blastomycosis – cryptococcosis candidiasis – aspergillosis – mucormycosis – miscellaneous mycoses and prothotheca infections – pneumocystis carini infection *PROTOZOAL AND HELMINTHIC INFECTIONS: general considerations – approach to the patient with parasitic infections – laboratory diagnosis of parasitic infections – therapy for parasitic infections *PROTOZOAL INFECTIONS – amoebiasis and infection with free – living amoebas – malaria and other diseases caused by red blood cell parasites leishmaniasis – trypanosomiasis – toxoplasma infection – protozoal intestinal infections and trichomoniasis *HELMINTHIC INFECTIONS – trichinosis and infections with other tissue nematodes – intestinal nematodes – filariasis and related infections (loiasis, onchocerciasis, and dracunculiasis) – schistosomiasis and other trematode infections – cestodes.

DISORDERS OF THE CARDIOVASCULAR SYSTEM – DIAGNOSIS – approach to the patient with heart disease – physical examination of the cardio vascular system – electrocardiography – diagnostic cardiac catheterization and angiography DISORDERS OF RYHTM – the bradyarrhythmias: disorders of sinus node function and av conduction disturbances – the tachyarrhythmias *DISORDERS OF THE HEART – normal and abnormal myocardial function – heart failure – cardiac transplantation congenital heart disease in the adult – rheumatic fever – valvular heart disease – cor pulmonale – the cardiomyopathies and myocarditis – pericardial disease – cardiac tumors, cardiac manifestations of sytemic diseases, and traumatic cardiac injury *VASCULAR DISEASE – atherosclerosis – acute myocardial infarction – ischemic heart disease – coronary angioplasty and other therapeutic applications of cardiac catheterization – hypertensive vascular disease – diseases of the aorta – vascular diseases of the extremities.

DISORDERS OF THE RESPIRATORY SYSTEM - *DIAGNOSIS –approach to the patient with disease of the respiratory system – disturbances of respiratory system – disturbances of respiratory function – diagnostic procedures in respiratory disease *DISEASE OF THE RESPIRATORY SYSTEM – asthma – hypersensitivity pneumonitis and eosinophilic pneumonias – environmental lung diseases – pneumonia, including narcotizing pulmonary infections (lung abscess bronchiectasis – cystic fibrosis – chronic bronchitis, emphysema, and airway obstruction – interstitial lung diseases – primary pulmonary hypertension pulmonary thromboembolism – disorders of the pleura, mediastinum and diaphragm – disorders of ventilation – sleep apnea – acute respiratory distress syndrome – mechanical ventilatory support Lung transplantation.

DISORDERS OF THE KIDNEY AND URINARY TRACT – approach to the patient with diseases of the kidneys and urinary tract – disturbances of renal function – acute renal failure chronic renal failure – dialysis and transplantation in the treatment of renal failure – pathogenetic mechanisms of glomerular injury – the major glomerulopathies –

glomerulopathies associated with multisystem diseases. Tubulointerstitial diseases of the kidney – vascular injury to the kidney – hereditary tubular disorders – nephrolithiasis – urinary tract obstruction.

DISORDERS OF THE GASTROINTESTINAL SYSTEM – DISORDERS OF THE ALIMENTARY TRACT – approach to the patient with gastrointestinal disease – gastrointestinal endoscopy – diseases of the esophagus – peptic ulcer and related disorders – disorders of absorption – inflammatory bowel disease: ulcerative colitis and crohn's disease – irritable bowel syndrome – diverticular, vascular, and other disorders of the intestine and peritoneum – acute intestinal obstruction – acute appendicitis
***LIVER AND BILIARY TRACT DISEASE** – approach to the patient with liver disease – evaluation of liver function – derangements of hepatic metabolism – bilirubin metabolism and hyperbilirubinemia – acute viral hepatitis – toxic and drug – induced hepatitis – chronic hepatitis – cirrhosis and alcoholic liver disease – major complications of cirrhosis – infiltrative and metabolic diseases affecting the liver – liver transplantation – diseases of the gallbladder and bile ducts
***DISORDERS OF THE PANCREAS** – approach to the patient with pancreatic disease – acute and chronic pancreatitis.
DISORDERS OF THE IMMUNE SYSTEM, CONNECTIVE TISSUE, AND JOINTS
***DISORDERS OF THE IMMUNE SYSTEM** – introduction to the immune system – the major histocompatibility gene complex – primary immune deficiency disease – human immunodeficiency virus (HIV) disease: aids and related disorders – amyloidosis
***DISORDERS OF IMMUNE – MEDIATED INJURY** – diseases of immediate type hypersensitivity – immunologically mediated skin diseases – systemic lupus erythematosus – rheumatoid arthritis – systemic sclerosis (scleroderma) dermatomyositis and poly myositis – Sjogren's syndrome – ankylosing spondylitis, reactive arthritis and undifferentiated spondyloarthropathy – Behcet's syndrome – the vasculitis syndromes – sarcoidosis.
***DISORDERS OF THE JOINTS** – approach to articular and musculoskeletal disorders – osteoarthritis – arthritis due to deposition of calcium crystals – infectious arthritis – psoriatic arthritis and arthritis associated with gastrointestinal disease – relapsing polychondritis and other arthritides.

ENDOCRINOLOGY AND METABOLISM -
***ENDOCRINOLOGY** – approach to the patient with endocrine and metabolic disorders – neuroendocrine regulation and diseases of the anterior pituitary and hypothalamus – disorders of growth – disorders of the neurohypophysis – diseases of the thyroid – diseases of the adrenal cortex – pheochromocytoma – diabetes mellitus – hypoglycemia – disorders of the testes – disorders of the ovary and female reproductive tract – endocrine disorders of the breast – disorders of sexual differentiation – disorders affecting multiple endocrine systems
***DISORDERS OF INTERMEDIARY METABOLISM** – disorders of lipoprotein metabolism – hemochromatosis – the porphyries – gout and other disorders of Purina metabolism – Wilson's disease – lysosomal storage diseases – glycogen storage diseases – inherited disorders of connective tissue – inherited disorders of amino acid metabolism and storage – inherited defects of membrane transport – galactosemia,

galactokinase deficiency and other rare disorders of carbohydrate metabolism – the lipodystrophies and other rare disorders of adipose tissue *DISORDERS OF BONE AND MINERAL METABOLISM – calcium, phosphorus, and bone metabolism: calcium – regulating hormones – diseases of the parathyroid glands and other hyper – and hypocalcemic disorders – metabolic bone disease – disorders of phosphorus metabolism – disorders of magnesium metabolism – Paget's disease of bone. Hyperostosis, fibrous dysplasia, and other dysplasia of bone and cartilage.

NEUROLOGIC DISORDERS - *DIAGNOSIS OF NEUROLOGIC DISORDERS – approach to the patient with neurologic disease – electrophysiologic studies of the central and peripheral nervous systems – neuroimaging in neurologic disorders – molecular diagnosis of neurologic disorders *DISEASES OF THE CENTRAL NERVOUS SYSTEM – migraine and the cluster headache syndrome – seizures and epilepsy – alzheimer's disease and other primary dementias – parkinson's disease and other extrapyramidal disorders – ataxic disorders – the motor neuron diseases – disorders of the autonomic nervous system – disorders of the cranial nerves – diseases of the spinal cord. Traumatic injuries of the head and spine tumors of the nervous system – multiples sclerosis and other demyelinating diseases – bacterial meningitis, brain abscess, and other suppurative intracranial infections – chronic and recurrent meningitis - aseptic meningitis, viral encephalitis, and prion diseases – nutritional and metabolic diseases of the nervous system *DISORDERS OF THE NERVE AND MUSCLE – diseases of the peripheral nervous system – myasthenia gravis and other diseases of the neuromuscular junction – diseases of muscle *CHRONIC FATIGUE SYNDROME – chronic fatigue syndrome *PSYCHIATRIC DISORDERS – mental disorders *ALCOHOLISM AND DRUG DEPENDENCY – alcohol and alcoholism – opioid drug abuse and dependence – cocaine and other commonly abused drugs – nicotine addiction.

ENVIRONMENTAL AND OCCUPATIONAL HAZARDS – specific environmental and occupational hazards *ILLNESSES DUE TO POISONS, DRUG OVERDOSAGE AND ENVENOMATION –poisoning and drug overdose – disorders caused by reptile bites and marine animal envenomations – ectorparasite infestations and arthropod bites and stings *SPECIFIC ENVIRONMENTAL AND OCCUPATIONAL HAZARDS – drowning and near. Drowning – electrical injuries – radiation injury – heavy metal poisoning.

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below:

1. *Lectures* : Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) *Didactic Lectures*: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library,
- 3) Research Methods
- 4) Medical code of Conduct and Medical Ethics
- 5) National Health and Disease Control Programmes
- 6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. *Journal Club* : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A time table with names of the student and the moderator should be announced at the beginning of every year.

3. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.

4. *Student Symposium*: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.

5. *Ward Rounds*: Ward rounds may be service or teaching rounds.
 - a) *Service Rounds*: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) *Teaching Rounds* : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.
 Entries of (a) and (b) should be made in the Log book.

6. *Clinico-Pathological Conference*: Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

7. *Inter Departmental Meetings*: Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of Medicine department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histo-chemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

8. *Teaching Skills* : Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. (See model check list in Chapter IV). Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.

9. *Continuing Medical Education Programmes (CME)* : Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.

10. *Conferences*: Attending conferences is optional. However it is encouraged.

Method of Training:

Emphasis is on hospital training with candidates given graded responsibility in the management and treatment of patients entrusted to them, while rotating in General medicine units and of subspecialty units. PG also attend respective units outpatient and inpatient activities and consultations.

Didactic lecture and demonstrations by basic and clinical departments to orient all new post graduate house staff to various departmental services and introduce basic concept of acute care management of medical / surgical emergencies. Involving Laboratory, Radiology, Blood bank services Also orientation to medical records and library facility. Lectures are organised over a period of two months and serve as introduction to all new post graduates to promote the need for integrated approach between various disciplines. Preferably these should be organized between 8-9 AM / 3-4 PM to minimise interference with the working of parent departments.

Special orientation to bio statistics, research methodology, legal medicine and computer skills should be organised through lectures for all first year post graduates during first six months.

Clinical seminar once a week involving participation of all staff of the department of Medicine to ensure combined staff moderated teaching.

Bedside clinics once a week involving one individual senior Professor or Associate Professor or Specialist.

Hospital conference once in fortnight involving multidisciplinary approach. Case selection to be done by senior faculty members to emphasize current diagnostic – therapeutic advances.

Journal club once a week 3-4 Journals by P.G's and Junior faculty under supervision of Senior faculty.

Subject seminar once a week Topics to be selected carefully and should not be repeated unnecessarily within 2 years (Total period of PG training is 3 years).

Mortality – CPC once a month (instead of Journal Club). Two to three case will be discussed and moderated by senior faculty. Other consultants invited based on the need.

Besides traditional OHP and 35 mm slide presentations, use of other forms of audio – visual aids may be encouraged

Dissertation Work

1. Every candidate pursuing degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
2. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
3. Every candidate shall submit to the Registrar (Academic), RGUHS, in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
4. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.
5. The dissertation should be written under the following headings:
 - i. Introduction
 - ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion
 - vii. Conclusion
 - viii. Summary
 - ix. References (Vancouver style)
 - x. Tables
 - xi. Annexures
6. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

7. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.
8. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
9. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Rotation

Details of rotation including ancillary postings year wise as follows:

PG I Year:

General Medicine – First four months in parent medical unit and next eight months in two or three other units. (PG will return to parent unit during III year of rotation for six months)

PG II Year:

Cardiology, Neurology – Two months each = 4 months

One months each in Pulmonary medicine, Immunology, Pharmacology Oncology, Hematology, Endocrinology, Nephrology, Gastroenterology, Dermatology & Psychiatry = 6 months

Special Elective rotation: 2 months

Special elective rotation should be encouraged like Cancer Institutes, Cardiology Institute, Neurology Institute and Multi-speciality centers of national & international repute. Candidate should make arrangement much in advance with approval of H.O.D of medicine.

Medical departments with less number of specialities, may rotate post graduates in general medicine department with postings in Medical intensive care unit. Coronary care unit and Emergency departments.

PG III Year:

General Medicine – Parent Medical Unit: 6 months

Two or three medical units: 6 months

During 3rd year rotation PG student works six months in parent unit and three months each in other two medical units. Postgraduate in III year training is expected to assume more responsibilities in managing patients and assist in first year residents and interns in wards, critical care unit and emergency rooms. Also should participate

actively in teaching undergraduate medical students and prepare himself or herself for the role of General Medical Specialist.

The students are encouraged to attend local, state and national level conferences of API, CSI etc. as part of CME programme.

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV).

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills :* Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) *Dissertation in the Department :* Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another

before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book*- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Every student must maintain a record book (diary/log book) and the work carried out by him and the training programme undergone by him during the training, including details of rotation, night calls, procedure and consultations done as M.D. candidates. These record books should be checked and assessed by faculty members imparting the training and certified by the head of the department.

Postgraduate student diary should include following activities.

Format for PG Diary (Log Book)

1. Cases seen on rounds – description of interesting cases and other miscellaneous topics discussed.
2. Outpatient cases seen and details of interesting cases with follow up.
3. Procedures done on inpatients and outpatients and consultation done.
4. Undergraduate teaching done during the day with details.

5. PG training programmes attended – details of bedside clinics, basic sciences, subject and clinical seminars, Journal clubs, mortality meet and hospital conference.
6. Night duties – details of patients managed and emergencies, consultation. Ward calls attended.
7. Details of study with topics covered during off hours in library / home. Periodicals and Journals reviewed with notes on interesting articles.
8. Medical meetings, Seminars, Local API / CSI meetings or other interesting CME, seminars attended.
9. Diary should be reviewed on weekly basis by unit faculty and certified on monthly basis for P.G.'s benefit at the end of each Medical/speciality rotation. Faculty should comment regarding absences and irregularities (Late arrivals and early departure) and make appropriate comments and suggest remedial measure for problematic prodigies.

Satisfactory progress and 80% attendance mandatory before student allowed to appear for University examination.

10. Size of note book: 15 cm x 21 cm with 200 pages. All note books should have seal of college and H.O.D.s approval: Extra note books utilised as and when necessary. Diaries should be presented at the time of University clinical exam for review by examiners as per University regulations.

Internal evaluation of P.G. Students performance during three years

I Year of M.D. Students

Assessment of students with multiple choice questions multiple short notes covering wide range of topics and practical examination with attention to history taking, symptomatology, clinical skills, relevant diagnostics and therapeutic plans ascertained. Suggested time of evaluation after first six months and at the end of first year rotation.

II Year of M.D. Students

Students should be evaluated at the end of cardiology and neurology postings with Theory and Practical Examinations by concerned specialities along with one faculty from General Medicine and make appropriate recommendation to meet minimal satisfactory guidelines expected of second year PG students. Other specialities with short rotations of one month, should be evaluated with MCQ format and Viva regarding candidates comprehension of the subject.

III Year of M.D. Students

P.G's should be evaluated at the beginning of his 3rd year training by panel of senior Postgraduate teachers. Suggested pattern of assessment with two essay type

theory papers and multiple choice questions, clinical skills, diagnostic and therapeutic skills evaluated intermittently by unit faculties.

Mock examination suggested – 3 to 4 months prior to final university exam should consist of two question papers each 3 hours duration, one MCO with 200 questions and practical and viva voice similar to university examination under the supervision of senior faculty.

Results of all evaluations should be entered into P.G's diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

A. *Written Papers (Theory)*

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows.

7

Paper I will include Basic Sciences, Current Advances in Genetics, Nutrition, and
Clinical Pharmacology

Paper II will include Cardiovascular system – Gastro Intestinal system ,
Infectious diseases including Tropical Medicine

Paper III will include Central Nervous system, Respiratory system, Immune system
connective tissue and joint disorders

Paper IV will include Nephrology, Endocrinology & Metabolism, Haematology, Oncology, Dermatology and Psychiatry Poisoning, Environmental and Occupational hazards

Note: The distribution of chapters / topics shown against the papers are suggestive only.

B. Clinical Examination

Total marks 200

To elicit competence in clinical skills and
Differential diagnostic formulations

One Long case – 100 marks
Two Short cases- 50 x 2

C. Viva Voice Examination

Marks 100

Aims to elicit candidates knowledge and investigative / therapeutic skills.

1) Viva-voice Examination: (80 marks)

All examiners will conduct viva-voice conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, Histo pathology slides, x-rays, ultrasound, CT scan images, etc., for interpretation. Questions on use of instruments will be asked. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

D) Maximum marks

Theory	Practical	Viva	Grand Total
400	200	100	700

Recommended Books

I. Clinical Methods

1. Hutchison's Clinical Methods, E. D. Michael Swash, 20th Edition, 1998 (ELBS W.B. Saunders).
2. Chambelain's Symptoms and Signs in Clinical Medicine- Ogilvie & Christopher, 12th Edition, 1997 (Butterworth H)

II. General Medicine

1. Harrison's Principles of Internal Medicine. 14th edition.
2. A.P.I. Textbook of Medicine - G. S. Sainani, 6th edition.
3. Cecil's Textbook of Medicine - Bennet & Plum. 20th edition (Saunders)
4. Oxford Textbook of Medicine- D. J. Seatherall, 3rd edition (Oxford University Press)
5. Davidson's Principles & Practice of Medicine. 19th edition.
6. Current Medical Diagnosis and Treatment - 2000. Lawrence. 39th edition (Mcgraw Hill)
7. Clinical Medicine - Kumar & Clark. 4th edition.
8. Medical Complications during Pregnancy - Bunow & Duffy, 5th edition.
9. Medical Genetics - Lynn b Jorde, 1998.

III. Cardiology

1. The Clinical Recognition of Congenital Heart Diseases - Joseph K. Perloff, 4th edition (Jaypee Brothers)
2. An Introduction to Electrocardiography - Leoschamroth, 7th edition (Black well Science)
3. Practical Electrocardiography - Marriot, 9th edition.
4. Textbook of Cardiovascular Medicine - Eugene Braunwald, 5th edition.
5. The Heart-Hurst, 9th edition.
6. Congenital Heart Diseases in Adults - Perloff, 2nd edition.

IV. Neurology

1. Principles of Neurology - Adam's, Victor, 6th edition (Mcgraw Hill).
2. Diseases of the Brain - Ed Brain, John Walton, 10th edition (Oxford univ)
3. Neurological differential diagnosis - John Patten.

V. Gastro-enterology

1. Current Diagnosis & treatment in Gastroenterology.
2. Diseases of the Liver and Biliary System - S. Sherlock, Dooley, 10th edition (Blackwell Sciences)
3. Gastrointestinal and liver diseases - Mark Feldman, Bruce Scharschmidt, 6th edition (Saundars)
4. Schiff's Diseases of the Liver - Schiff, 8th edition.

VI. Nephrology

1. Textbook of Renal Disease, Judith, Lawrence, 2nd edition (Churchill Livingstone)
2. Diseases of Kidney, Schrier, 6th edition (Little Brown).
3. Manual of Nephrology

VII. Hematology

1. Wintrobe's Clinical Hematology, Richard Lee, 10th edition (Willium & Wilkins)
2. De Gruchy's Clinical Hematology in Medical Practice, Frank Firkin, 5th edition.

VIII. Rheumatology

1. Rheumatology, John Klippel, 1994.

IX. Endocrinology

1. William's Textbook of Endocrinology, Wilson Fuster, 9th edition (W. B. Saunders)

X. Respiratory Medicine/Critical Care Medicine

1. Chest Medicine essentials of Pulmonary and Critical Medicine, Ronald George, 3rd edition (Williams & Wilkins)
2. Manual of Intensive Care Medicine, Irwin and Rippe, 3rd edition.
3. Textbook of Respiratory Diseases, Crofton & Douglas.
4. A Practical guide to Pulmonary medicine, Goldstein.
5. Interpretation of Pulmonary Function Tests, Hyatt, scanlan.

X. Geriatrics/gerontology

1. Geriatric Medicine, 3rd edition.

XI. Oncology

1. Principles and practice of Oncology, De Vita.

XII. Infectious Disease

1. A Practical approach to Infectious Diseases, Reese, 3rd edition.
2. Manual of Clinical Problems in Infectious Diseases, 4th edition.

Reference Books**Anatomy/physiology/Biochemistry/Biostatistics**

1. Clinical Neuroanatomy for Medical Students. 4th edition.
2. Textbook of Medical Physiology, Guyton. 9th edition.
3. Review of Medical Physiology, Ganong, 18th edition.
4. Harper's Biochemistry, 25th edition
5. Lippincott's illustrated review-Biochemistry, 2nd edition.
6. Methods in Biostatistics, B. K. Mahajan, 6th edition

Pharmacology/Microbiology/Pathology

1. Textbook of Pharmacology, Goodmann & Gillmann's.
2. Washington Manual of Medical Therapeutics, 29th edition.

Clinical Methods

1. Mcleod's Clinical Examination, 10th edition (Churchill Livingstone)
2. Bickerstaff's Neurological examination clinical practice, J. Spillane, 6th edition (Blackwell science)
3. Bedside Cardiology, Constant, 5th edition.
4. The Neurologic Examination, de'jong; 5th edition (Lippincott)

Journals

1. Journal of Association of Physicians of India (JAPI)
2. British Medical Journal (BMJ) - weekly
3. New England Journal of Medicine - Bimonthly
4. The Lancet - monthly
5. American Journal of Medicine - monthly
6. Issues in Medical Ethics
7. Indian Journal of Tuberculosis
8. Dermatology Clinics
9. GUT (Gastroenterology)
10. Postgraduate Medical Journal
11. Stroke
12. Blood
13. Neurologic Clinic
14. Indian Journal of Nephrology
15. Public Health Papers

Chapter III

M.S. General Surgery

Goals

The goals of postgraduate training course in Surgery would be to train a MBBS doctor who will :

- Practice surgery efficiently and effectively, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing surgical education irrespective of whether he is in a teaching institution or is a practicing surgeon.
- Be a motivated 'teacher' – defined as a surgeon keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives:

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

A list of objectives related to knowledge and higher cognitive abilities that are expected to be achieved during the course is given.

At the end of the training, the candidate must be able to:

- Describe aetiology, pathophysiology, principles of *diagnosis* and management of common surgical problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement *therapy* including blood transfusion
- Describe common malignancies in the country and their management including prevention
- Demonstrate understanding of basic sciences relevant to general surgery
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Update himself by self study and by attending courses, conferences and seminars relevant to surgery.

- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform *minor* operative procedures and common general surgical operations independently and the *major* procedures with help from a senior surgeon.
- provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- manage acute abdominal emergencies and poly trauma.
- Undertake thorough wound management, including burn wounds.
- Undertake complete patient monitoring including the preoperative and post operative care of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his surgical practice. Professional honesty and integrity are to be fostered. Surgical care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Essential Knowledge

The course contents have been identified and categorized as essential knowledge as under. This is to enable the student to achieve the objectives of the course. It is recognized that General surgery today mainly covers abdominal operations, thyroid and breast diseases. A general surgeon should also have knowledge of some common problems in allied specialties. Further he should be familiar with complications, current controversies and recent advances in these topics.

The topics are considered under :

- Basic sciences,
- General Surgery topics and
- Specialty topics.

Some overlap between the latter two categories are to be expected.

Basic sciences include anatomy, physiology, biochemistry, microbiology and pathology, as found in current text books. These standard topics are recommended to be studied in as much as they are applicable to the practice of surgery. The stress is on applied anatomy of the parts dealt with by the surgeon as defined by the skills list; patho-physiology and surgical pathology.

General Surgery Topics include the following:

History of surgery
Clinical History and examination – detailed systematic history taking, clinical examination of various systems, coming to a provisional working diagnosis.
Rationale of diagnostic tests – Ordering diagnostic tests with prioritizing the needs, based on the clinical, hospital and the patient's socioeconomic condition
Informed consent / Medico legal issues – Understanding the implications of acts of omission and commission in practice. Issues regarding Consumer Protection Act. – Implications in a medico-legal case like accidents, assaults etc.
Communication skills with patients – Understanding clarity in communication, compassionate explanations and giving emotional support to at the time of suffering and bereavement.
Principles of surgical audit – Understanding the audit of process and outcome. Methods adopted for the same. Basic statistics
Principles of evidence based medicine – Understanding journal based literature study; the value of text book, reference book articles; value of review articles; original articles and their critical assessment. Understanding the value of retrospective, prospective, randomized controlled and blinded studies. – Understanding the principles and meanings of various biostatistical tests applied in these studies.
Medical ethics / Social responsibilities of surgeons
Use of computers in surgery – Components of a computer; its use in practice – principles of word processing, spread sheet functions, database and presentation; the internet and its uses. The value of computer based systems in bio medical equipment.
Health insurance, Health Care financing
Undertaking clinical audit
Prospective data collection / writing case reports and clinical papers

Giving presentations / Computer presentations
Preoperative workup – concept of fitness for surgery; basic medical workup; workup in special situations like, diabetes, renal failure, cardiac and respiratory illness; risk stratification;
Principles of operative surgery like asepsis, antisepsis, sterilization
Surgical sutures, drains, prosthetic grafts
Postoperative care – concept of recovery room care; airway management; assessment of wakefulness; management of cardiovascular instability in this period; criteria for shifting to a ward; pain management.
Basic surgical instrumentation – Principles of surgical instrumentation; their maintenance and sterilization.
Surgical diathermy, lasers
Wound management – wound healing; factors influencing healing; basic surgical techniques; properties of suture materials ; appropriate use of sutures.
Assessment of head, chest and abdominal trauma and triage – Assessment of a trauma victim; resuscitation; care at the site; triage; care in the accident department; criteria for immediate surgery; immediate workup and logical referral criteria.
Fluid and electrolyte balance / Acid – Base metabolism – The body fluid compartments; metabolism of water and electrolytes; factors maintaining homeostasis; causes for and treatment of acidosis and alkalosis.
Blood transfusion – Blood grouping; cross matching; blood component therapy; complications of blood transfusion; blood substitutes; auto transfusions; cell savers.
Surgical infections – asepsis and antisepsis; microbiological principles; rational use of antibiotics; special infections like synergistic gangrene and diabetic foot infections. Hepatitis and AIDS
Surgical nutrition – nutritional assessment; metabolic response to stress; need for nutritional support; enteral nutrition; routes of access to GI tract; parenteral nutrition; access to central veins for nutritional support.
Principles of laparoscopy / GI endoscopy – laparoscopic instrumentation; physiology of pneumoperitoneum; complications of laparoscopy; diagnostic and therapeutic applications. GI endoscopic instrumentation; Diagnostic and therapeutic applications of upper GI, Lower GI and ERCP studies.
Principles of oncology – cell kinetics; causation of tumours; principles of oncologic surgery, radiotherapy and chemotherapy; paraneoplastic syndromes; cancer pain management; palliative care
Principles of burn management – types of thermal injury; assessment of extent; immediate management; late management; skin cover; rehabilitation
Principles of fracture management – fracture healing; principles of immobilization; complications; principles of internal fixation.
Airway obstruction / management – anatomy of the airway; principles of keeping the airway patent; mouth to mouth resuscitation; oropharyngeal airway;

endotracheal intubation; crico-thyroidotomy; tracheostomy.
Shock and Pulmonary failure – types of shock; diagnosis; resuscitation; pharmacologic support; ARDS and its causes; prevention; ventilatory support.
Anaesthesia – stages of anaesthesia; pharmacology of inhalational, intravenous and regional anaesthetics; muscle relaxants
Assessment of trauma ; Multiply injured patient/ closed abdominal and chest injuries / penetrating injuries; fractures pelvis; urological injuries; vascular injuries; trauma scores
Acute abdomen – Appendicitis / Peritonitis / Perforated viscus / Intestinal obstruction
Hernias – simple and complicated – various types of hernias; their repair; prosthetic materials
Critical care – Cardiorespiratory failure – management of shock; including monitoring; sepsis scores; pharmacological support.
Pain control – acute and chronic pain; cancer and non-cancer pain; patient controlled analgesia.
Breast disease – benign and malignant disease; diagnosis; investigation; screening for cancer; genetics of breast cancer
Thyroid disease – solitary nodule; investigations; multinodular goiter; Hashimoto's disease; cancer
Upper GI disease – oesophageal and gastro-duodenal disorders
Hepato-biliary disease
Pancreatic disease
Colo-rectal disease / Anal disease
Soft-tissue neoplasms
Endocrine disease

The specialty topics include the following:

- GI endoscopy and Laparoscopy:

Principles of GI endoscopy
Complications including infective considerations
Diagnostic and therapeutic GI endoscopy including upper GI, lower GI and pancreato-biliary systems
Physiology of pneumoperitoneum
Diagnostic laparoscopy
Laparoscopic therapeutic procedures

- Neurosurgery

Head and neck trauma; acute management and rehabilitation
Concept of brain death / medico-legal implications

Peripheral nerve injuries
Neoplasms of the brain and meninges
Acute and chronic infections of the brain and meninges
Hydrocephalus
Spinal injuries
Monitoring intracranial tension

- Urology

Urological injuries
Urothelial tumours / Chemotherapy
Prostatic hypertrophy
Hypospadias
Pyleonephritis / perinephric abscess
GU tuberculosis
Scrotal disease
Endourology
Peritoneal dialysis / CAPD / haemodialysis
Transplantation / harvesting kidney
Urinary diversion
Infertility / Vasectomy
Pyeloplasty / hydronephrosis

- Oncology

Imaging CT/ MRI CT guided FNAB/C
Breast, thyroid and GI malignancies
Head and neck tumours
Chemotherapy / Adjuvant therapy
Post excision reconstruction
Radiotherapy

- Plastic Surgery

Burns management
Facial injuries
Principles of tissue transfer
Cleft lip and palate
Congenital defects of hand
Pressure sores
Principles of microsurgery

Hypospadias
Details of skin flap
Nerve repair
Vascular repair
Hand injuries / tendon injury

- Cardio-thoracic surgery

Flail chest / thoracic trauma
Bronchogenic carcinoma
Lobectomies
Pneumonectomy
Endocarditis prophylaxis
Pulmonary function tests
Control of major haemorrhage
Operations on the diaphragm
Coronary artery disease
Valvular heart disease
Lobectomies and pneumonectomies
Oesophageal disease
Operations on thoracic aorta
Mediastinal tumours
Basics of congenital heart disease

- Vascular Surgery

Vascular imaging
AV malformations
Exposure of major arteries and veins / vascular anastomosis
Varicose veins
Chronic venous insufficiency.
Vascular emergencies – trauma, embolism
Peripheral vascular disease – Atherosclerosis, arteritis
Details of vascular prosthesis

- Paediatric Surgery

Fluid and electrolyte management
Preparation for surgery / postop care
Hernias
Spinal fusion defects

Ventral defects
Undescended testes
Hypertrophic pyloric stenosis
Hirschsprung's disease
Diaphragmatic hernia
Tracheo oesophageal fistula
Anorectal anomalies
Necrotising enteritis

- Gynaecological Surgery

Pelvic inflammatory disease
Ectopic pregnancy
Ovarian Cysts
Caesarean section
Family planning

Essential Surgical Skills

Surgery is a skill-based discipline. The following list is drawn up with a view to specifying basic minimum skills to be acquired. While an attempt has been made to specify the year wise distribution of the learning of skills (in the latter part of this curriculum), it is recognized that the process is a continuous one. The principle of giving graded responsibility to the student is to be applied throughout the course. The year wise distribution of the skills recommended are to be used as general guideline. Some overlap may be there. Provision of training in various specialty subjects has been made during the second year of the course. Skills in specialty subjects may be acquired both during the specialty postings and during the general surgical postings in the parent department, if the procedures are carried out. The list within the tables, indicates the surgical procedures that the students should, by the end of the course, be able to perform independently (PI) by himself/herself or should have performed with assistance (PA) during the course. The other categories of surgical procedures mentioned form a general guide for the procedures that the student should either have observed (O) or have assisted the operating surgeon (A). Note, for all categories, the student washes up in the operating room. There may be an overlap in the skill list between the general surgery list and the specialty list. Where different numbers are mentioned for the same/similar procedures between the general surgery and specialty lists, the higher number is applicable as the prescribed number. (Note that the total number is not the sum of the numbers mentioned for the same/similar procedures in the general surgery and specialty lists.)

Skills may be considered under the following headings.

- a) Basic graduate skills
- b) Ward procedures
- c) ICU procedures
- d) Emergency room procedures
- e) Preoperative workup procedures
- f) Postoperative procedures
- g) Minor surgical procedures
- h) Major operating room techniques
- i) General surgical procedures
- j) Speciality surgical procedures

a) Basic graduate skills

The student should have acquired the certain skills during his under-graduation and internship. These skills have to be reinforced at the beginning of the training period.s These skills include:

Procedure	Category	Year	Number
Insertion of I.V.lines, nasogastric tubes, urinary catheters, etc.,	PI	I	50
Minor suturing and removal of sutures	PI	I	50
Removal of tubes and drains	PI	I	50
Routine wound dressings	PI	I	50

b) Ward Procedures

Ward work forms an important part of the training of the surgeon. In addition to the touting examination of the patient with proper recording of findings, diligent practice of the following is recommended.

Procedure	Category	Year	Number
Abdominal Paracentesis including Diagnostic Peritoneal Lavage	PI	I	5
Ability to teach UG's and Interns	PI	I	NA
Blood sampling – venous and arterial	PI	I	NA
Bone Marrow Aspiration	PI	I	2
Burns dressing	PI	II	10
Communication skills with patients, relatives, colleagues and paramedical staff	PI	I	NA*

Ordering of the requisite laboratory and Radiological investigations and Interpretation of the reports in light of the clinical picture	PI	I	NA
Proficiency in common ward procedures	PI	I	NA
Skills for Per-rectal examination and Proctoscopy	PI	I	NA
Thoracocentesis	PI	II	5
Universal precautions against communicable diseases	PI	I	NA
Venesection	PI	I+II+III	5

NA: Not Applicable

c) ICU Procedures:

Procedure	Category	Year	Number
Insertion of Arterial lines	PI	II	10
Insertion of Central venous lines	PI	I	10
Insertion of Endotracheal tubes	PI	II	10
Insertion of Peritoneal Dialysis Catheters	A/PA	I,II,III	5
Intercostal Drainage	PI	II	5
Suprapubic Puncture/ Stab Cystostomy	PI	II	5
Tracheotomy	PI	I	2
Working Knowledge of Ventilators and various Monitors	PI	I	NA
Interpretation of Arterial blood gases	PI	I	NA
Correction of Electrolyte disturbances	PI	I	NA
Prescribing Parenteral & Enteral nutrition	PI	I	NA

d) Emergency Room Procedures

Procedure	Category	Year	Number
Application of Splints for Fractures	PI	I	NA
Arterial and Venous Lines	PI	I	NA
Assessment and initial management of Polytrauma	PI	I	NA
Cardiopulmonary Resuscitation	PI	I	NA

Management of Airway Obstruction	PI	I	NA
Management of Shock and Cardiac / Respiratory failure	PI	I	NA
Recognition and Initial management of Surgical Emergencies	PI	I	NA
Suturing Techniques	PI	I	NA

e) Pre-operative Workup

Procedure	Category	Year	Number
Ability for adequate pre-operative preparation in special situations like Diabetes, renal failure, cardiac and Respiratory failure etc. and risk Stratification	PI	I	NA
Communication skills with special reference to obtaining Informed Consent	PI	I	NA
Proper pre-operative assessment and preparation of patients including DVT prophylaxis, Blood transfusion and Antibiotics	PI	I	NA

f) Post-operative Care

Procedure	Category	Year	Number
Airway management	PI	I	NA
Basic Physiotherapy	PI	I	NA
Management of epidural analgesia	PI	I	NA
Management of Fistulae	PI	I	NA
Management of postoperative hypo and hypertension	PI	I	NA
Postoperative pain control	PI	I	NA
Skills for Nutritional rehabilitation of patients	PI	I	NA
Skills for proper Fluid & Antibiotic management	PI	I	NA
Stoma care	PI	I	NA

g) Minor O.T. procedures

Procedure	Category	Year	Number
Circumcision under Local Anesthesia	PI	I	5
Drainage of Abscesses	PI	I	5
FNAC	PI	I	5
Major dressings	PI	I	20
Minor Anorectal Procedures (Haemorrhoids – Banding, Cryotherapy, Suturing etc,; Anal dilatation and Fissures), Fistulectomy	PI	III	10
Minor Biopsies – Lymph node, ulcer, swellings etc.,	PI	I	20
Reduction and plaster application of simple fractures and dislocations	PA	II	10
Removal of simple subcutaneous swellings	PI	I	10
Sigmoidoscopy and Upper G.I. endoscopy (preferable in endoscopy room)	PA/A/O	II	10
Suturing Techniques	PI	I	20
Vasectomy	PI/PA	I	5
Wound debridement	PI	I	10

h) Major Operating room techniques

Procedure	Category	Year	Number
Instrument arrangement and trolley layout	PA	I	NA
Skills in Sterilization techniques, O.T.Layout and Asepsis	O	I	NA
Skin preparation – painting and draping	PI	I	NA
Techniques of scrubbing and gowning	PI	I	NA

i) General Surgical Operative Procedures

Procedure	Category	Year	Number
Appendicectomy	PA	I	10

Appendicectomy	PI	III	5
Cholecystectomy	PI and PA	III	1 and 3
Closure of Colostomy	PA	III	2
Closure of peptic ulcer / under-running bleeding ulcer / vagotomy drainage	PI	III	3
Colostomy	PA	III	2
Cysts and sinuses of the neck	PA	III	2
Diagnostic laparoscopy	PA	III	3
Drainage of breast abscess / Excision of breast lump	PI	I	10
Groin Hernia repair	PI	II / III	5
Gynaecomastia	PA	III	2
Haemorrhoidectomy / Fissurectomy / Simple fistulectomy	See Minor OT procedures		
Hemicolectomy	PA	III	1
Herniotomy / Orchidopexy in children	PA	III	3
Laparotomy for abdominal trauma / splenectomy	PI	III	3
Laparotomy for intestinal obstruction / bowel resections / bowel anastomosis	PI	III	3
Management of complex wounds	PI	I	10
Mastectomy	PA/A	III	2
Opening and closing the abdomen	PI	I	5
Opening and closing the chest	PI	III / III	1
Parotidectomy	A	III	2
Release of bands and simple adhesive obstruction	PI	II	5
Thyroid lobectomy	PA	III	3
UGI endoscopy / Flexible sigmoidoscopy	A/O	II/III	10
Ventilation	PI	II	5
Wide excision of breast tumours / mastectomy / microdochectomy	PA	III	3
Gastrostomy / feeding jejunostomy	PA	III	3

j) Speciality Procedure

There may be repetition of some of the procedures listed under this category and those listed under General surgical procedures. Where different numbers are mentioned for the same/similar procedures between the general surgery and specialty lists, the higher number is applicable as the prescribed number. (Note that the total number is not the sum of the numbers mentioned for the same/similar procedures in the general surgery and specialty lists.)

Laparoscopy And GI Endoscopy

Procedure	Category	Year	Number
Diagnostic and therapeutic Upper and Lower GI endoscopy	PA	III	10
Diagnostic laparoscopy	PA	III	3
Diagnostic Upper GI endoscopy	PA	III	10
Laparoscopic Cholecystectomy	A	III	3

Neurosurgery

Procedure	Category	Year	Number
Craniotomy	A	II	2
Management of paraplegia	A	II	2
Peripheral nerve repair	A	II	2
Prevention of nerve injury – specific operations	A	II	2
Suturing complex scalp wounds	PI	II	2
Trephining	PA	II	2

Urology

Procedure	Category	Year	Number
Carcinoma penis	PA/A	II	3
Catheterization	PI	I	NA
Circumcision	PI	I	10
Diagnostic cystoscopy	PA/A	II	3
Inguinal Block Dissection	PA	II	1
Meatotomy	PI	II	3

Nephrectomy – partial / total	A	II	3
Nephrolithotomy	A	II	3
Orchidectomy	PA/A	II	3
Orchidopexy	A	II	3
Retroperitoneal lymph node dissection	O	II / III	1
Supra pubic cystostomy	PI	II	3
Total amputation of penis	A	II	1
TUR / Open prostatectomy	A	II	5
Ureterolithotomy	A	II	3
Urethral / Urogenital injuries	A	II	3
Urethral dilatation	PI	II	5
Varicocele	PA/A	II	3
Vasectomy	PI	I / II / III	10

Oncology

Procedure	Category	Year	Number
All radical operations – Breast, Thyroid, GI and Facio-maxillary malignancies	A	II	2 EACH
Breast lumpectomy	PI	II	5
Functional neck node dissection	A	II	3
Gastrectomy / Bowel resection	A	II	3
Imprint cytology	PA	II	3
Metastatic workup	PA	II	5
Stoma care	PI	II	5
Thyroid surgery	A	II	5
U/s guided biopsy	A/O	II	3

Plastic Surgery

Procedure	Category	Year	Number
Burn resuscitation	PI	I	5
Lip surgery	A	II	5

Local blocks in anaesthesia	PI	I	10
Minor hand injuries (specify)	PI	II	5
Nerve repair	A	II	2
Post excision reconstruction	A	II	2
Reimplantation of digits	O	II	1
Skin flap surgery	O	II	2
Split skin graft	PI	II	3
Stitch craft	PI	I	NA
Tendon repair	PA	II	2
Wound debridement	PI	I	10

Paediatric Surgery

Procedure	Category	Year	Number
Anorectal anomalies	A	II	2
Circumcision / meatoplasty	PA	II	10
Herniotomy	PA	II / III	2
Intercostal aspiration	PI	II	2
Laparotomy for peritonitis	PA	II	5
Lymph node biopsy	PI	II / III	5
Non operative treatment of volvulus	A/O	II	2
Orchidopexy	PA/A	II	5
Ostomies	PA	II	2
Paediatric emergencies	A/PA	II	10
Pyloromyotomy	PA/A	II / III	5

Cardiothoracic Surgery

Procedure	Category	Year	Number
Canulation of artery and vein	A	II	2
Chest injuries	PA	II / III	5
Empyema drainage / decortication	PI	II	2
Endotracheal intubation	PI	I	10

Intercostal drainage	PI	I	5
ITU duties	PI	II/III	NA
Lobectomies and pneumonectomies	O	II	2
Oesophageal surgery	O	II/III	2
Opening and closing the chest	PA	II	2
Pericardiectomy	O	II	2
Removal of FBs	A	II / III	2
Remove pulse generator (pacing)	PA/A	II	1
Rib resection	PA	II / III	2
Tracheostomy	PI	III	5
Undertake sternotomies	PA	II / III	2
Vein and arterial harvesting	PA/A	II / III	2
Ventilator management	PA	I	10

Vascular Surgery

Procedure	Category	Year	Number
AV shunts for vascular access	PA	II / III	2
Bypass graft – prosthetic	A	II / III	2
Conservative amputations	PI	II / III	5
Embolectomy	PA	II / III	2
Post-traumatic aneurysms	A	II / III	2
Sympathectomy	PA	II / III	2
Use of heparin	PI	II / III	10
Varicose vein surgery	PI	II / III	2
Vascular suturing	PA	II / III	2
Vein graft	A/O	II / III	2
Vein patch repair	A/O	II / III	2

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below:

1. *Lectures* : Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.
 - a) *Didactic Lectures*: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:
 - 1) Bio-statistics
 - 2) Use of library,
 - 3) Research Methods
 - 4) Medical code of Conduct and Medical Ethics
 - 5) National Health and Disease Control Programmes
 - 6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

- b) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. *Journal Club* : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist in Chapter IV). A time table with names of the student and the moderator should be announced at the beginning of every year.

3. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.

4. *Student Symposium*: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.

5. *Ward Rounds*: Ward rounds may be service or teaching rounds.
 - a) *Service Rounds*: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) *Teaching Rounds* : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries of (a) and (b) should be made in the Log book.

6. *Clinico-Pathological Conference*: Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
7. *Inter Departmental Meetings*: Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of Surgery department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histo-chemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

8. *Teaching Skills* : Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. (See model check in Chapter IV). Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.
9. *Continuing Medical Education Programmes (CME)* : Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.
10. *Conferences*: Attending conferences is optional. However it is encouraged.

Rotation and posting in other departments

The listed knowledge and skills are to be learnt over a period of 3 years. The process is a continuous one. However the recommended period and timing of training in basic subjects, allied departments and specialty departments is given below.

In the first year, during the morning session, student should work in the parent department. It is recommended that 2 years and 4 months are spent in General Surgery and 8 months in allied and specialty departments. Depending on the time and opportunities available, some of the procedures listed for second year activity can be shifted either to the first or the third year. Students must be 'on call' on a regular basis. The total duration of postings in core and other specialties will be eight months.

Basic Science

Basic science should be an essential part of training. It should be done as concurrent studies during the 1st year of training. Atleast two hours daily may be in the first six months of the course. In the first year, during the morning session, time is spent in the parent department. In the afternoons basic science teaching relevant to surgery can be done in the respective departments.

Topics for study to include Anatomy, Physiology, Pathology, Microbiology, Pharmacology, Anaesthesia and Radiology

Pathology – Concurrent study - Recommend daily Grossing sessions, weekly Surgical pathology sessions and monthly CPCs.

Radiology – Concurrent study – adequate exposure to modern imaging modalities like u/s, CT, MRI and angiography

Allied Specialty Training

Students are posted to core allied specialty subjects Viz. Anaesthesia and ICU for one month and Orthopaedics including trauma (Accident and emergency) for 2 months during the second year of training. Posting to the Department of Obstetrics and Gynaecology for one month is optional. This posting may be in lieu of one of the other specialties (except the core specialties) depending on the choice of the candidate.

Other Surgical Specialty Subjects

Postings to other speciality departments will be during the second year. The departments and duration of postings are as under:

Department	Duration
• Paediatric surgery	4 weeks
• Plastic surgery	4 weeks
• Cardiothoracic surgery	4 weeks

- | | |
|--------------------|---------|
| • Vascular surgery | 4 weeks |
| • Neurosurgery | 4 weeks |
| • Urology | 4 weeks |
| • Oncology | 4 weeks |

Dissertation

Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

The dissertation should be written under the following headings:

- i. Introduction
- ii. Aims or Objectives of study
- iii. Review of Literature
- iv. Material and Methods
- v. Results
- vi. Discussion
- vii. Conclusion
- viii. Summary
- ix. References
- x. Tables
- xi. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

our copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.

The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.

For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be

recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, in Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-Pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Surgical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) *Clinical Operative skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Operative skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills :* Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) ***Dissertation in the Department*** : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) ***Periodic tests***: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) **Work diary / Log Book**- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) ***Records***: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

i) *Theory*

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short

essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I:	Basic Sciences -	100 marks
	1. Anatomy	
	2. Physiology	
	3. Other basic science topics covered in syllabus	

Introduction to Surgery, Basic Surgical Principles. Wounds, tissue repair and scars. Critical care; fluid, electrolyte and acid-base balance; blood transfusion. Nutritional support and rehabilitation. Anaesthesia and pain relief. Wound infection. Special infections. Acquired immunodeficiency Syndrome (AIDS). Sterile precautions. Transplantation. Tumours, Cysts, Ulcers, Sinuses. Plastic and reconstructive surgery, skin lesions. Burns. Arterial disorders. Venous disorders. Lymphatic system. Day surgery. Audit in surgery. Surgical ethics.

Paper II:	100 marks
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Eye and orbit. Cleft lip and palate, developmental abnormalities of the face, palate, jaws and teeth. Maxillofacial injuries. Nose and sinuses. Ear. Oral and oropharyngeal cancer and procancer. Salivary gland disorders. Pharynx, larynx and neck. Thyroid gland and the thyroglossal tract. Parathyroid and Adrenal glands. Breast. Thorax. Heart and Pericardium

Paper III:	100 marks
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Anastomoses, Oesophagus. Stomach and duodenum. Liver. Spleen. Gallbladder and bile ducts. Pancreas. Peritoneum, omentum, mesentery and retroperitoneal space. Small and large intestines. Intestinal obstruction. Vermiform appendix. Rectum. Anus and anal canal. Hernias, Umbilicus, Abdominal wall. Principles of Laparoscopic surgery.

Paper IV:	100 marks
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Orthopedics: Musculoskeletal disorders. Fracture and Dislocations - General, specific. Diseases of bones and joints - infection, tumours, generalised diseases and chronic joint diseases, congenital disorders. Wrist and hand. Foot.

Nervous system: Neurological disorders affecting the musculoskeletal system. Spine, vertebral column and spinal cord. Nerves. Cranium (Scalp, skull, brain).

Genito -Urinary System: Urinary symptoms, Investigation of the urinary tract, anuria. Kidneys and ureters. Urinary bladder. Prostate and seminal vesicles. Urethra and penis. Testis and scrotum.

Note: The distribution of chapters / topics shown against the papers are suggestive only.

- ii) Clinical** 200 marks
 There shall be one long case and two short cases to be examined and presented by each candidate.

Type of cases

Long case	1	100 marks
Short cases	2 (50x2)	100 marks

- iii) Viva voce** 100 marks

1) Viva-voice Examination: (80 marks)

All examiners will conduct viva-voice conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, Histo pathology slides, X-rays, ultrasound, CT scan images, etc., for interpretation. Questions on operative surgery and use of instruments will be asked. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

iv.

Maximum marks for	Theory	Practical	Viva	Grand Total
M.S Gen. Surgery	400	200	100	700

Recommended books and Journals

Text books

- Charles V. Mann, R.C.G. Russell, Norman S. Williams, Bailey and Love's Short Practice of Surgery, 23rd Edition, 2000, Chapman & Hall
- David C. Sabiston : Text book of Surgery : The Biological Basis of Modern Surgical Practice, 15th Edition, 1971, W.B. Saunders
- Seymour I. Schwartz, G. Tom Shines, Frank C. Spencer, Wendy Cowles Husser: Principles of Surgery, Vol. 1 & 2, 7th Edition, 1999, Mc.Graw Hill
- JSP Lumley : Hamilton Bailey's Physical Signs, 18th Edition, 1997, Butterworth/Heinemann.
- R.W.H. McMinn : Last's Anatomy : Regional and Applied, 10th Edition, 1999, Churchill Livingstone

6. Sir Charles Illingworth, Bruce M. Dick, A Text Book of Surgical Pathology, 12th Edition, 1979, Churchill Livingstone.
7. K.Das : Clinical Methods in Surgery, 8th Edition, 1968, Suhas Kumar Dhar, Calcutta
8. R.F. Rintoul : Farquharson's Text Book of Operative Surgery, 8th Edition, 1995, Churchill Livingstone
9. Somen Das : A practical Guide to Operative Surgery, 4th Edition, 1999, S. Das, Calcutta.
10. Pankaj Patel, V.V.Dewoodkar, Handbook of Surgical Instruments for Undergraduates, 1992, Bhalani publishing, House
11. R.A.Jamieson and A.W.Kay : Text book of Surgical Physiology, Livingstone.
12. James Kyle : Pye's Surgical Handicraft, Indian Edition, K.M. Varghese Company.

Reference text books

1. William F. Ganong : Review of Medical Physiology, 2000, Lange Medical Publication
2. Roshan Lall Gupta : Year Book of Surgery, (Series) Jaypee Brothers
3. Roshan Lall Gupta : Recent advances in Surgery, (Series) Jaypee Brothers
4. I. Taylor and C.D. Johnson : Recent Advances in Surgery, (Series) Churchill Livingstone.
5. Lloyd M. Nyhus, Robert J.Baker and Joseph E. Fischer : Mastery of Surgery Vol. 1 & 2, 3rd Edition, 1997, Little Brown & Company.
6. Peter J.Morris and Ronald A Malt : Oxford Text Book of Surgery, Vol. 1 & 2, 1994, Oxford University Press
7. Charles Rob and Rodney Smith : Operative Surgery (All Volumes), 2nd Edition, 1971, Butterworths.
8. C.Palanivelu : Art of Laparoscopic Surgery, 1999, Paras Publishing
9. Michael J. Zinner, Seymour I. Schartz and Harold Ellis : Maingot's abdominal operations, Vol. 1 & 2, 10th Edition, 1997, Prentice Hall International.
10. Kevin G. Burnand and Anthony E. Young : The New Aird's companion to surgical studies, 1992, Churchill Livingstone.
11. Guyton : Text Book of Medical Physiology, 9th Edition, 1998, W.B. Saunders.
12. Hamilton Bailey : Emergency Surgery, 1999, Butterworth
13. Cuschiery : Essentials of Surgical Practice, 3rd Edition, 1995, K.M. Verghese Company
14. Goliger : Surgery of the Anus, Ractum and Colon.

15. Lee McGregor : Synopsis of Surgical Anatomy, 12th (Indian) Edition, 1998, K.M. Verghese Company
16. W.T. Irvine : Modern Trends in Surgery, Series, Butterworths

Reference books

1. Irving Taylor, Timothy G. Cooke and Perra Guillou : Essential General Surgical Oncology, 1996, Churchill Livingstone.
2. James A, O'Neil, Marc I. Owe, Jay L. Grosfeld, Eric W. Fopnkalsrud and Arnold G. Coran : Pediatric Surgery, Vol.1 & 2, 5th Edition, 1998, Mosby
3. Anthony S. Fauci and Others : Harrison's Principles of Internal Medicine, Vol. 1 & 2, 14th Edition, 1998, Mc Graw Hill
4. Sheila Sherlock and James Dooley : Diseases of the Liver and Biliary System, 10th Edition, 2000, Blackwell Scientific Publication
5. Incent J. Devita, Samuel Hellman and Steven A. Roseberg, Cancer : Principles and Practice of Oncology, 6th Edition, 2000, Lippincott
6. Blumgart : Surgery of Liver & Biliary Tract, Vol. 1 & 2, 2nd Edition, 1994, Churchill Livingstone
7. Campbell and Smith : Urology, Vol. 1,2 & 3, 5th Edition, 1986, W.B. Saunders
8. Smith : General Urology
9. Grab and Smith : Plastic Surgery, 5th Edition, 1997

Journals for reference

Indian Journal of Surgery
 British Journal of Surgery
 American Journal of Surgery
 Surgery International
 New England Journal of Medicine
 Surgery, Gynaecology & Obstetrics
 Year Book of Surgery
 Surgical Clinics of North America
 Lancet
 British Medical Journal
 Urological Clinics of North America
 Indian Journal of Medical Research

Additional reading

1. Compondium of Recommendations of Various Committees on Health and Development (1943-1975) DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, Min. Of Health and Family Welfare, Govt. Of Indian, Nariman Bhawan, New Delhi, P – 335
2. National Health Policy : Min. of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983
3. Samosh Kumar : The Elements of Research, writing and editing 1994, Dept. Of Urology, JIMPER, Pondicherry
4. Srinivasa D K etal : Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry
5. Indian Council of Medical Research : “Policy Statement of Ethical considerations involved in Research on Human Subjects”, 1982, I.C.M.R., New Delhi.
6. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
7. Francis C M : Medical Ethics, Jaypee Publications, Bangalore, 1993.
8. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
9. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991, 424-8
10. Kirkwood B.R.: Essentials of Medical Statistics, 1st Ed., Oxford, Blackwell Scientific Publications 1988.
11. Mahajan B.K. : Methods in Bio-statistics for Medical Students, 5th Edition, New Delhi, Jaypee Brothers Medical Publishers, 1989.
12. Raveendran B Gitanjali : A Practical approach to PG dissertation, New Delhi, Jaypee Publications, 1998.
13. R.K. Chaube : Consumer Protection Act and Medical Profession, 1st Edition, 1999, Jaypee Brothers.

Model Checklists for Assessment of Scientific Papers for Publication

Sl. No.	Criteria	Distribution of Marks	Marks awarded
1.	Originality	10	
2.	Clarity & Quality of presentation	10	
3.	Relevance	10	
4.	Review of Literature	10	
5.	Quantum of works involved	15	
6.	Methodology, Sensitivity, sample size, controlled, not controlled study etc.	25	
7.	Advancement in knowledge	10	
	Total	90	

Signature of the Evaluator

Name

Designation

Chapter III

Post Graduate Courses in Obstetrics & Gynaecology

M.S. Obstetrics & Gynaecology

Goal

The goals of postgraduate training course would be to train a MBBS doctor who will:

- Practice efficiently and effectively, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education in the speciality irrespective of whether he is in a teaching institution or is a practicing specialist.
- Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

With the knowledge and skills developed at the completion of the course, the candidate shall be able to:-

- i. Offer to the community, the current quality of 'Standard care' in obstetrics & Gynaecological diagnosis' as well as therapeutics. Medical or surgical, for common as well as referred conditions.
- ii. Periodically self assess his or her performance and keep abreast with ongoing advances in the field & apply the same in his / her practice.
- iii. Be aware of his or her own limitations to the application of the speciality in situations which warrant referral to major centers or individuals more qualified to treat.
- iv. Apply research and epidemiological methods during his/her practice. The candidate shall be able to present or publish work done by him/her.
- v. Contribute as an individual or in a group or institution towards the fulfillment of national objectives with regard to prevention of maternal mortality and morbidity and improving the neonatal outcome.
- vi. Effectively communicate with patients or relatives so as to educate them sufficiently and give them full benefit of informed consent to treatment and ensure compliance.
- vii. Effectively communicate with colleagues.

Course Contents

It includes topics not only of obstetrics and Gynaecology but also those aspects of Medicine, Surgery, Pediatrics, applied Anatomy Physiology, Pathology, Pharmacology and Microbiology relevant to the practice of both Obstetrics and Gynaecology. It is intended as a guide to the candidates and it is not comprehensive.

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As and when there is newer development it becomes eligible for inclusion. Hence the candidates should familiar themselves with the current content of the scientific journals and reviews of major topics.

Theory

Basic Sciences

Genetics

Normal and abnormal Karyo types
Problems of intersex
Genetic causes of infertility and early pregnancy loss
Genetic aspects of artificial insemination

Anatomy Including Embryology

Gametogenesis, Ovulation, fertilization, implantation, development of foetus and placenta. Development of male and female genital tract. Problems of abnormal development of genital tract in Obstetrics and Gynaecology. Anatomy of Urogenital system, including pelvic musculature. Blood supply, innervation and Lymphatic drainage of the pelvis and reproductive organs.

Pathology

Pathology of inflammatory disease, degenerative and neoplastic disease of vulva vagina, cervix and uterus, fallopian tubes, Ovaries and broad ligament.

Haematology

Blood groups, Rh factor, incompatibility, Blood transfusion.

Biochemistry

Steroid and prostaglandin synthesis and metabolism in mother and foetus. Maternal and foetal carbohydrate, lipid, amino-acid metabolism and iron metabolism. Synthesis and secretion of foetal pulmonary surfactant.

Endocrinology

Structure, synthesis, function, metabolism and principles of assay of hormones, produced from hypothalamus, Anterior and posterior pituitary, Thyroid, Pancreas, Adrenal cortex, adrenal medulla, Ovary, Testis, and placenta.

Pharmacology

Placental transfer of drugs and its effects on mother and foetus, Eg: Antibiotics, anti hypertensives, Psychotropic drugs, Oral contraceptives, Chemotherapeutic drugs, Anticonvulsants, Anti coagulants and Oxytocic drugs, effects of tobacco and alcohol on pregnant mother and foetus. Teratogenic effect of drugs taken during lactational period.

Immunology

Basic immunology including primary and secondary immune response, mechanism of antibody production. HLA system and graft rejection. Change in pregnancy and the foetus as a graft. Immunological pregnancy tests. Rhesus and other Isoimmunisation. Active and passive immunisation and Auto immune disease.

Microbiology

Epidemiology and pathophysiology of disease developing in pregnancy that is Septic abortion, Preterm labour, PROM, Puerperal sepsis, Mastitis, Septic shock and Neonatal sepsis. Microbiology of TORCH infection, Syphilis, Chlamydia, Mycoplasma, hepatitis and HIV.

Maternal physiological changes during pregnancy

- i) Fluid and electrolyte balance.
- ii) Changes in respiratory, Cardio vascular system.
- iii) Changes in Gastro-intestinal system – including liver and pancreas
- iv) Change in urinary system.
- v) Hematological changes including coagulation mechanism and fibrionolytic system

Teratology

Mechanisms of teratogenesis. Effect of possible teratogens – drugs virus radiation and other agents.

Antenatal care

Includes diagnosis, of pregnancy, Identification of high risk group of mothers and foetus with different modality of investigation. Clinical monitoring or maternal/foetal welfare and selection of place of delivery.

Physiology of Labour

Causation of onsets of labour

Intrapartum care

Maternal and foetal monitoring

Mechanism and management of normal labour

Abnormal pregnancy

- i. Medical diseases and disorders complicating pregnancy and child birth
- ii. Obsteric complications of pregnancy
- iii. Multiple pregnancy
- iv. Congenital malformations
- v. Foetal growth retardation
- vi. Repeated pregnancy loss
- vii. Preterm labour

- viii. Prolonged pregnancy
- ix. Malpresentations
- x. Shock and collapse
- xi. Ectopic pregnancy
- xii. Rh incompatibility.

Abnormalities of Labour and Delivery

Includes induction of labour and abnormal uterine action

Social Obstetrics

Study of interplay of social and environmental factors and human reproduction going back to premarital a preconception period.

- i. Implementing safe motherhood initiative.
- ii. Community maternal health care
- iii. Antenatal checkup
- iv. MCH problems
- v. Risk approach of pregnant women
Anaemia, STD syphilis, tetanus, AIDS.
- vi. Domicilliary care
- vii. Postnatal complications
- viii. Low birth weight (L.B.W.)
- ix. Socio economic status and birth weight correction
- x. Infant feeding
- xi. Road to health chart and school health programme.
- xii. Pre pregnancy and post pregnancy counseling
- xiii. Reproductive and child health (RCH)
- xiv. National Health Programmes

Family welfare programmes including Reconstructive surgeries

Temporary methods like

- Chemical contraceptives
- Barrier methods
- Hormonal contraception
- IUD

Permanent methods like

- Tubectomy
- Laparoscopy tubal ligation
- Minilap

Reconstructive surgeries like

- Tuboplasty
- Vaso Vasotomy

Perinatology

- i. The term new born infant
- ii. Low birth weight baby, - Preterm, - IUGR
- iii. Asphyxia neonatorum
- iv. Respiratory distress
- v. Jaundice in new born
- vi. Haemorrhagic disease of new born
- vii. Convulsions in new born
- viii. Injuries of the new born
- ix. Infection of new born
- x. Diarrhea in new born
- xi. Vomiting of the new born
- xii. Congenital malformation of new born.

Neonatal

Early neonatal complication, infection and management.

Mortality and Morbidity

Epidemiology, Magnitude of the problem, causes, prevention and management of Maternal mortality and morbidity. Perinatal mortality,

Gynaecology

History taking with special reference to Gynaecological history, abdominal and pelvic examination, relevant investigation to arrive at most probable diagnosis.

Topics includes: Infection, Newgrowths (both benign and malignant) and other pathological disorders of vulva, vagina, urinary bladder, cervix, uterus, fallopian tubes, Ovaries and Pelvic cellular tissues including STD and HIV.

Adolescent Gynaecology

Menstrual disorders, including amenorrhoea, menopause, postmenopausal Gynaecological problems and management of the aged and elderly women.

Chromosomal disorders – including intersex

Gynaecologic clinical cytopathology.

Contraception and family planning.

Infertility and ART

Hormones therapy.

Problem of sex and marriage

Clinical Obstetrics & Gynaecology

Obstetrics

- i. Diagnosis of early pregnancy and its complication and management.
- ii. AIM of ANC and management of high risk pregnancies.
- iii. To work in labour wards and to manage normal and complicated deliveries.

- iv. Neonatal care and resuscitation in labour wards
- v. Follow-up of normal and abnormal deliveries during postnatal period
- vi. Assisting caesarean section initially, by the end of the course, they shall be able to do caesarean sections independently.
- vii. I C U Management.
- viii. Family welfare programmes and reconstructive surgeries of the fallopian tubes.
- ix. Rural obstetrics care and referral services.

Gynaecology

- i. To work in O.P.D. and examine Gynaecology cases routinely,
- ii. Minor operations: To assist in the beginning and carry out work independently by the end of I year
- iii. Major Operations: To assist as second assistant for the I six months and as first assistant for the next 6 months and do major operations like vaginal hysterectomy with P.F.R. and abdominal hysterectomy, Ovariectomy with the assistance of senior doctors. By the end the course the candidate shall be familiar with the techniques of above mentioned operations and to do independently.
- iv. To do investigations like HSG and USG under guidance initially and independently by the end of course.
- v. To assist medico legal cases.
- vi. Writing case records
- vii. Candidate should write separate PG case sheets, They should keep diary and log book and get verified by the Unit Chief by the end of each month.

Essential Research Skills

- i. Basic statistical knowledge.
 - a. Ability to undertake clinical & basic research
 - b. Descriptive and inferential statistics
 - c. Ability to publish results of one's work.
- ii. This could be achieved during the course by attending workshops on research methodology, basic statistics classes and regularly having journal clubs etc., where selected articles are taken and evaluated for content quality and presentation.

Communication abilities

Ability to interact with and work as a team with other colleagues, with patients and with teachers.

Record keeping

The ability to maintain records as scientifically as possible. Knowledge of computer is helpful.

Surgical Skills

1. Conducting minimum 25 cases of normal delivery including forceps and ventose application.
Episiotomy repair, colposyntesis 3rd degree perineal tear suturing

2. Tubectomy both mini lap and laparoscopic sterilisation.

3. Destructive operations (25 cases)

Minor O.T. procedures:

- i. MTP, D&C, suction evacuation, M.R. Mid-Trimester procedures extraamniotic instillation with of 2%ethacardine inj, Local application cerviprime gel insertion of intrauterine devisors.
- ii. Cervical and Endometrial biopsy, electric couterisation and cold cautery tube testing procedure and histosalphingogram,
- iii. Cervical biopsy, pap-smear,
- iv. Diagnostic laparoscopy and colposyntosis

Major O.T. Procedures

- i. Caesarean section minimum 10 to be done and 20 operations to be assisted
- ii. Vaginal hysterectomy minimum 20 to be assisted and 5 to be performed
- iii. Abdominal hysterectomy minimum 20 to be assisted and 5 to be performed
- iv. Ovariectomy
- v. Cervical encercelage
- vi. Caesarian hysterectomy
- vii. Salpingectomy for ectopic pregnancy
- viii. Laparotomy
- ix. Internal iliac ligation
- x. Internal pelvic version and MRP
- xi. Operation for inversion of uterus

4 Special Operations (Only to assist)

- i. Tuboplasty
- ii. Myomectomy
- iii. Ovarian de-bulking operation
- iv. Ventrofixation (Gilliam's operation)
- v. Sling operations for prolapse
- vi. Wartheim's hysterectomy
- vii. Simple and radical vulvectomy
- viii. Operation for stress incontinence

Year wise Structured Training Schedule

I year

Theoretical knowledge, Basic sciences

i. Examination and diagnosis of Obstetrics & Gynaecological cases with relevant investigations case recording.

ii. *Surgical Skills*

Assisting Caesarian sections as second assistant initially and later on as first assistant,

with supervision.

Assisting all major gynaecological operations like, vaginal & abdominal hysterectomies as a second assistant.

Minor Operations

Assisting minor operations like M.T.P., Tubectomy, Laprascopy, Cervical biopsy,

D & C in the initial period, and later on doing independently under supervision.

II Year

Theoretical knowledge of Allied subjects

Clinical examination and diagnosis: The student is encouraged to take diagnostic, investigational and therapeutic decisions.

Surgical Skills: At the end of the second year the student should be capable of operating without assistance but under supervision, like caesarean section and minor operations like, M.T.P. cervical biopsy, D & C, tubectomies, outlet forceps, emergencies during delivery. The student must know how to manage the complications during and after delivery confidently.

Conference and workshops: Encouraged to attend one conference of State level and at National level. Presentation of paper in the conference should be encouraged.

The student should be involved actively in presentation of seminars, panel discussion, Journal clubs and case discussions with seniors, and to maintain record in Log book.

IIIrd Year

Should be through with basic, allied and recent advances.

Clinical Diagnosis & Examination: Should be able to make clinical diagnosis and be familiar with techniques of operations like caesarean sections, abdominal and vaginal hysterectomies, reconstructive surgeries of fallopian tubes and surgeries on ovarian tumours. Techniques of assisted reproductive technologies.

Teaching activities: Final year student should take lead in conducting seminars, panel discussions, Journal Clubs and case discussions with I & II year students. The student should involve himself/herself in teaching undergraduate students specially bedside clinics.

The student should attend National and State level conferences, C.M.E. Programmes and workshops on colposcopy, Hysteroscopy and endoscopic surgeries, including ultrasound guided procedures. The student must also be exposed to the Assisted reproductive technologies like, I.V.F-E-T. ICSI; and also to observe radical surgeries in Gynaec-Oncology.

Rotation and Labour ward Postings

- i. The student must work in labour wards atleast 6 months during II & III year. (3 months each year)
- ii. Pediatrics : 1 month
- iii. Radio-diagnosis including Ultrasound and NST: 1 month
- iv. Radiotherapy (oncology): 1 month
- v. Anesthesia: 1 month

Teaching/Learning Experience

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below:

1. *Lectures* : Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) *Didactic Lectures*: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library,
- 3) Research Methods
- 4) Medical code of Conduct and Medical Ethics
- 5) National Health and Disease Control Programmes
- 6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. *Journal Club* : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A time table with names of the student and the moderator should be announced at the beginning of every year.
3. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.
4. *Student Symposium*: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.
5. Attending OPD work
6. Ward Rounds: Ward rounds may be service or teaching rounds.
 - a) Service Rounds: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) Teaching Rounds : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.
 Entries of (a) and (b) should be made in the Log book.
7. *Clinico-Pathological Conference*: Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
8. *Inter Departmental Meetings*: Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of Surgery department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histo-chemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

8. *Teaching Skills:* : Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. (See model check list in Chapter IV). Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.
9. *Continuing Medical Education Programmes (CME):* Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.
10. *Conferences:* Attending conferences is optional. However it is encouraged.

The unit heads should scrutinize it every week end. IIOD., should see and sign at the end of each unit posting.

- i. P.G. posted to each unit should write the case history examine the patients in detail and carry out the investigations and shall be responsible for pre operative, operative and post operative care. By the end of the unit posting, shall submit the same to the unit chief and take the signature
- ii. 1. Clinical cases: Each M.D. student should present atleast 20 clinical cases for discussion in the three year posting (10 Obstetrics & 10 Gynaecology)
2. Journal club: Each candidate shall present atleast 10 papers on recent advances in Obstetrics and Gynaecology from latest journals in the Journal clubs.
3. Subject Seminar: They shall participate actively in minimum of eight subject seminars.
4. They should actively undertake the undergraduate teaching programmes

C.M.E. programmes: shall attend CME programmes and shall present minimum of two papers in any of the Scientific conferences.

Dissertation

Every candidate pursuing degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review, of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

Every candidate shall submit to the Registrar (Academic) of RGUHS, in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the data of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

The dissertation should be written under the following headings:

- i Introduction
- ii Aims or Objectives of study
- iii Review of Literature
- iv Material and Methods
- v Results
- vi Discussion
- vii Conclusion
- viii Summary
- ix References
- x Tables
- xi Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper 9 (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.

The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.

For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The

assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills :* Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) *Dissertation in the Department :* Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book*- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

A. Theory

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I:	Basic Science as applicable to Obstetrics and Gynecology
Paper II:	Obstetrics and Gynecology

Paper III: Gynecology

Paper IV: Social Obstetrics and Family Welfare Planning

Note: The distribution of chapters / topics shown against the papers are suggestive only.

B. Clinical 200 marks

There shall be two long cases and two short cases to be examined and presented by each candidate. Marks shall be 200.

Type of cases

Long cases: One case of Obstetrics and one case of Gynecology. Each case carries 75 marks.

Short cases: One case of Obstetrics and one case of Gynecology. Each case carries 25 marks.

C. Viva Voce: 100 Marks

1) Viva-Voce Examination: (80 Marks)

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, dummies (pelvis, foetal skull), gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, NST etc., for interpretation. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 Marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

D.

Maximum marks for M.D. Obstetrics & Gynecology	Theory	Practical	Viva	Grand Total
	400	200	100	700

a) Recommended Books

Sl. No.	Name of the Author	Name of the Book	Edition	Name of the Publications
1.	IAN Donald	'Practical Obstetrics problems'	5 th Edn.	B.A.Publication
2.	Farnandes Aris	'Practical guide to high risk pregnancy & delivery'		Mosbi Publications
3.	William's	'Text book of Obstetrics'	21 st Edn.	(not known)
4.	Holland	'Manual of Obstetrics'		B.I.P. Publications
5.	Jeffcoat's	'Principles of Gynaecology'	5 th Edn.	Butterworth

				Heighmen
6.	Shaw's	Text book of Gynaecology'	12 th Edn.	B.L. Churchill Livingston.
7.	Dutta	'Text book of Gynaecology'	2 nd Edn.	Central Publications.
8.	Parulekar	'Practical Gynaecology & Obstetrics'	Latest Edn.	Vora Publications
9.	Munrokar's	'Operative Obstetrics'	10 th Edn.	A.T.B.S. Publi.
10.	Telend's	'Operative Gynaecology'	8 th Edn.	Lipincorttriven Publications
11.	Barus or celil and Burrows	'Medical disorders in Obstetrics practice'	3 rd Edn.	Blackwell science Publications
12.	Rathnam	'Obstetrics and Gynaecology'	2 nd Edn.	Orient Longmen Publications
13.	Arul kumar	'The management of labour	1 st Edn.	Orientlongmen Publications
14.	Bhaskar Rao	'Clinical Gynaecology'	4 th Edn.	Orient Longmen Publications
15.	C.S. Dawn	'Text books of Obstetrics and Neunatology'	13 th Edn.	B.B. Publications
16.	C.S. Dawn	'Text books of Gynaecology and contraception'	13 th Edn.	B.B. Publications
17.	J. Studd	'Progress in Obstetrics and Gynaecology	Latest Edn.	I.S.E. Publications
18.	Padubidri	'Text book of Obstetrics'	1 st Edn.	C.B.S. Publications
19.	Novak's	'Gynaecology'	12 th Edn.	Williams and Willkins Publications
20.	Dewhurst	'Obstetrics and Gynaecology'	5 th Edn.	Blackwell Science
21.	Speroff	'Clinical Gynaecologic Endocrinology and infertility'	6 th Edn.	Lippincot Publications
22.	Boney's	'Gynaecological surgery'	9 th Edn.	A.I.T.B.S. Publications
23.	Callen	'Ultrasonography'		C.B.S. Publications
24.	Desai	Infertility and sonography'		J.P. Publications
25.	R. Rajan	Reproductive endocrinology'		J.P. Publications
26.	Williams	'Endocrinology'		W.B.S.

				Publications
27.	Pall-P.G.	'Manual of operative laprascope'		Modern Publications
28.	J. Samuel	'Clinical sonography'		J.D.P. Publications
29.	Kistner's	'Gynaecology-Principles and practice'	6 th Edn.	Hercoat Brey's Asia Publications
30.	Macher and Moor	'Essentials of Obstetrics and Gynaecology'	3 rd Edn.	W.B. Sunder's Publications

Journals

1. Journal of FOGSI
2. Clinics of Obstetrics & Gynecology- North America
3. Fertility and Sterility
4. British Journal of Obstetrics & Gynecology
5. American Journal of Obstetrics & Gynecology
6. American association of gynecology laproscopy
7. Obstritics & Gynecologic clinic
8. Current opinion in Obstetrics & Gynecology
9. Briggs update: Drugs in pregnancy & lactation.
10. Operative technique in gynecologic surgery

Diploma in Obstetrics & Gynaecology (D.G.O)

Goal

The diploma course in Obstetrics & Gynaecology is a 2 Year integrated course, after satisfactory completion of which the candidate shall be able to practice Obstetrics & Gynaecology competently, confidently and safely in the community that he/she serves.

The goals of postgraduate training course would be to train a MBBS doctor who will:

- Practice Obstetrics & Gynaecology, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education.
- Be a motivated 'teacher' – defined as a surgeon keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

With the knowledge and skills developed at the completion of the course, the candidate shall be able to:-

- i. Offer to the community, the current quality of 'Standard care' in obstetrics & Gynaecological diagnosis' as well as therapeutics. Medical or surgical, for common as well as referred conditions.
- ii. Periodically self assess his or her performance and keep abreast with ongoing advances in the field & apply the same in his / her practice.
- iii. Be aware of his or her own limitations to the application of the specialty in situations which warrant referral to major centers or individuals more qualified to treat.
- iv. Epidemiological methods during his/her practice.
- v. Contribute as an individual or in a group or institution towards the fulfillment of national objectives with regard to prevention of maternal mortality and morbidity and improving the neonatal outcome.
- vi. Effectively communicate with patients or relatives so as to educate them sufficiently and give them full benefit of informed consent to treatment and ensure compliance.
- vii. Effectively communicate with colleagues.

Course contents

It includes topics not only of obstetrics and Gynaecology but also those aspects of Medicine, Surgery, Pediatrics, applied Anatomy Physiology, Pathology, Pharmacology and Microbiology relevant to the practice of both Obstetrics and Gynaecology. It is intended as a guide to the candidates and it is not comprehensive. As and when there is newer development, it becomes eligible for inclusion. Hence the

candidates should be familiar themselves with the current content of the scientific journals and reviews of major topics.

Theory

Basic Sciences

Genetics

Normal and abnormal Karyo types

Problems of intersex

Genetic causes of infertility and early pregnancy loss

Genetic aspects of artificial insemination

Anatomy Including Embryology

Gametogenesis, Ovulation, fertilization, implantation, development of foetus and placenta. Development of male and female genital tract. Problems of abnormal development of genital tract in Obstetrics and Gynaecology. Anatomy of Urogenital system, including pelvic musculature. Blood supply, innervation and Lymphatic drainage of the pelvis and reproductive organs.

Pathology

Pathology of inflammatory disease, degenerative and neoplastic disease of vulva vagina, cervix and uterus, fallopian tubes, Ovaries and broad ligament.

Haematology

Blood groups, Rh factor, incompatibility, Blood transfusion.

Biochemistry

Steroid and prostaglandin synthesis and metabolism in mother and foetus. Maternal and foetal carbohydrate, lipid, amino-acid metabolism and iron metabolism. Synthesis and secretion of foetal pulmonary surfactant.

Endocrinology

Structure, synthesis, function, metabolism and principles of assay of hormones, produced from hypothalamus, Anterior and posterior pituitary, Thyroid, Pancreas, Adrenal cortex, adrenal medulla, Ovary, Testis, and placenta.

Pharmacology

Placental transfer of drugs and its effects on mother and foetus, Eg: Antibiotics, anti hypertensives, Psychotropic drugs, Oral contraceptives, Chemotherapeutic drugs, Anticonvulsants, Anti coagulants and Oxytocic drugs, effects of tobacco and alcohol on pregnant mother and foetus. Teratogenic effect of drugs taken during lactational period.

Immunology

Basic immunology including primary and secondary immune response, mechanism of antibody production. HLA system and graft rejection. Change in pregnancy and the foetus as a graft. Immunological pregnancy tests. Rhesus and other Isoimmunisation. Active and passive immunisation and Auto immune disease.

Microbiology

Epidemiology and pathophysiology of disease developing in pregnancy that is Septic abortion, Preterm labour, PROM, Puerperal sepsis, Mastitis, Septic shock and Neonatal sepsis. Microbiology of TORCH infection, Syphilis, Chlamydia, Mycoplasma, hepatitis and HIV.

Maternal physiological changes during pregnancy

- i) Fluid and electrolyte balance.
- ii) Changes in respiratory, Cardio vascular system.
- iii) Changes in Gastro-intestinal system – including liver and pancreas
- iv) Change in urinary system
- v) Hematological changes including coagulation mechanism and fibrinolytic system

Teratology

Mechanisms of teratogenesis. Effect of possible teratogens – drugs virus radiation and other agents.

Antenatal care

Includes diagnosis, of pregnancy, Identification of high-risk group of mothers and foetus with different modality of investigation. Clinical monitoring or maternal/foetal welfare and selection of place of delivery.

Physiology of Labour

Causation of onsets of labour

Intrapartum care

Maternal and foetal monitoring

Mechanism and management of normal labour

Abnormal pregnancy

- i. Medical diseases and disorders complicating pregnancy and child birth
- ii. Obstetric complications of pregnancy
- iii. Multiple pregnancy
- iv. Congenital malformations
- v. Foetal growth retardation
- vi. Repeated pregnancy loss
- vii. Preterm labour
- viii. Prolonged pregnancy
- ix. Malpresentations
- x. Shock and collapse
- xi. Ectopic pregnancy
- xii. Rh incompatibility.

Abnormalities of Labour and Delivery

Includes induction of labour and abnormal uterine action

Social Obstetrics

Study of interplay of social and environmental factors and human reproduction going back to premarital a preconception period.

- i. Implementing safe motherhood initiative.
- ii. Community maternal health care
- iii. Antenatal checkup
- iv. MCH problems
- v. Risk approach of pregnant women
Anaemia, STD, tetanus, AIDS.
- vi. Domicilliary care
- vii. Postnatal complications
- viii. Low birth weight (L.B.W.)
- ix. Socio-economic status and birth weight correction
- x. Infant feeding
- xi. Road to health chart and school health programme.
- xii. Pre pregnancy and post pregnancy counselling
- xiii. Reproductive and child health (RCH)
- xiv. National Health Programmes

Family welfare programmes including Reconstructive surgeries

Temporary methods like

- Chemical contraceptives
- Barrier methods
- Hormonal contraception
- IUD

Permanent methods like

- Tubectomy
- Laparoscopy tubal ligation
- Minilap

Reconstructive surgeries like

- Tuboplasty
- Vaso Vasotomy

Perinatology

- i. The term new born infant
- ii. Low birth weight baby - Preterm, - IUGR
- iii. Asphyxia neonatorum
- iv. Respiratory distress
- v. Jaundice in new born
- vi. Haemorrhagic disease of new born
- vii. Convulsions in new born
- viii. Injuries of the new born
- ix. Infection of new born
- x. Diarrhea in new born
- xi. Vomiting of the new born
- xii. Congenital malformation of new born.

Neonatal

Early neonatal complication, infection and management.

Mortality and Morbidity

Epidemiology, Magnitude of the problem, causes, prevention and management of Maternal mortality and morbidity. Perinatal mortality,

Gynaecology

History taking with special reference to Gynaecological history, abdominal and pelvic examination, relevant investigation to arrive at most probable diagnosis.

Topics includes: Infection, New growths (both benign and malignant) and other pathological disorders of vulva, vagina, urinary bladder, cervix, uterus, fallopian tubes, Ovaries and Pelvic cellular tissues including STD and HIV.

Adolescent Gynaecology

Menstrual disorders, including amenorrhoea, menopause, postmenopausal Gynaecological problems and management of the aged and elderly women.

Chromosomal disorders – including intersex

Gynaecologic clinical cytopathology.

Contraception and family planning.

Infertility and ART

Hormones therapy.

Problem of sex and marriage

Clinical Obstetrics & Gynaecology

Obstetrics

- i. Diagnosis of early pregnancy and its complication and management.
- ii. AIM of ANC and management of high-risk pregnancies.
- iii. To work in labour wards and to manage normal and complicated deliveries.
- iv. Neonatal care and resuscitation in labour wards
- v. Follow-up of normal and abnormal deliveries during postnatal period
- vi. Assisting caesarean section initially, by the end of the course, they shall be able to do Caesarean sections independently.
- vii. I C U Management.
- viii. Family welfare programmes and reconstructive surgeries of the fallopian tubes.
- ix. Rural obstetrics care and referral services.

Gynaecology

- i. To work in O.P.D. and examine Gynaecology cases routinely,
- ii. Minor operations
To assist in the beginning and shall carry on work independently by the end of I year
- iii. Major Operations
To assist as second assistant for the 1st six months first assistant for the next 6 months and do some major operations like vaginal hysterectomy with P.F.R. and abdominal hysterectomy, Ovariectomy under supervision of senior doctors. By the end of the course the candidate shall be familiar with the techniques of above mentioned operations and to do independently.
- iv. To do investigations like HSG and USG under guidance initially and independently by the end of course.
- v. To assist medico legal cases.
- vi. Writing case records
- vii. Candidate should write separate PG case sheets, They should keep diary and log book and get verified by the Unit Chief by the end of each month.

Communication abilities

Ability to interact with and work as a team with other colleagues, with patients and with teachers.

Record keeping

The ability to maintain records as scientifically as possible. Knowledge of computer is helpful.

Surgical Skills

a) *Procedures to be performed independently(PI)*

1. Conducting minimum 25 cases of normal delivery including forceps and ventouse application.
Episiotomy repair, colposyntesis, 3rd degree perineal tear suturing
2. Tubectomy both mini lap & laparoscopic sterilisation.
3. Destructive operations (25 cases)
4. **Minor O.T. procedures:**
 - i. Medical termination of pregnancy (MTP), D&C, suction evacuation, Menstrual Regulation (MR), Mid-Trimester procedures extra amniotic instillation with of 2% ethacardine inj, Local application cerviprime gel insertion of intrauterine devisors.
 - ii. Cervical and Endometrial biopsy, electric cauterisation and cold cautery tube testing procedure and histosalphingogram,
 - iii. Cervical biopsy, pap-smear,
 - iv. Diagnostic laparoscopy & colposyntosis

5. Major O.T. Procedures

- i. Caesarean section minimum 5 to be done and 20 operations to be assisted
- ii. Ovariectomy
- iii. Cervical encirculation
- i. Salpingectomy for ectopic pregnancy
- iv. Laparotomy
- v. Internal pelvic version and MRP
- vi. Operation for stress incontinence

b) Procedures to be observed (Candidate to wash and observe) (O)**6. Special Operations**

- i. Tuboplasty myomectomy
- ii. Ovarian de-bulking operation
- iii. Ventrofixation (Gilliam's operation)
- iv. Sling operations for prolapse
- v. Wertheim's hysterectomy
- vi. Simple and radical vulvectomy
- vii. Caesarean hysterectomy
- viii. Internal iliac ligation
- ix. Operation for inversion of uterus
- x. Vaginal hysterectomy minimum 10 to be assisted
- xi. Abdominal hysterectomy minimum 10 to be assisted

d) Year wise Structured Training Schedule**1st year**

- i. Theoretical knowledge, Basic sciences
- ii. Examination and diagnosis of Obstetrics and Gynaecological cases with relevant investigations case recording.
- iii. *Surgical Skills:* Assisting Caesarean sections as second assistant initially and later on as first assistant, under supervision.
Assisting all major gynaecological operations like, vaginal and abdominal hysterectomies as a second assistant.

Minor Operations

Assisting minor operations like M.T.P. Tubectomy, Laparoscopy, Cervical biopsy,
D & C in the initial period, and later on doing independently under supervision.

IInd Year

Theoretical knowledge of Allied subjects

Clinical examination and diagnosis. The student is encouraged to take diagnostic, investigational and therapeutic decisions.

Surgical Skills

At the end of the second year the student should be capable of operating without assistance but under supervision, like caesarean section and minor operations like, M.T.P. cervical biopsy, D & C, tubectomies, outlet forceps, emergencies during delivery. The student must know how to manage the complications during and after delivery confidently.

Conference and workshops

Should be encouraged to attend one conference of State level & at National level. Presentation of paper in the conference should be encouraged.

The student should be involved actively in presentation of seminars, panel discussion, Journal clubs and case discussions with seniors, and to maintain the record.

e) Rotation and Labour ward Postings

- | | | |
|------|--|----------------------|
| i. | The student must work in labour wards atleast 6 months during I and II year. | |
| | | (3 months each year) |
| ii. | Pediatrics | 1 month |
| iii. | Radio-diagnosis including Ultrasound and NST | 1 month |
| iv. | Radiotherapy (oncology) | 1 month |
| v. | Anesthesia | 1 month |

Teaching/Learning Experience

- i. Attending OPD work
- ii. Operations or assisted or to be performed
- iii. Teaching undergraduate students
- iv. Attending the teaching programmes:
 - a) Case presentation,
 - b) Seminars,
 - c) Journal clubs,
 - d) Mortality review
 - e) Panel discussion
 - f) Clinico-Pathological conference,
 - g) CME Programmes and OBG society meetings

The unit heads should scrutinize it every weekend. HOD., should see and sign at the end of each unit posting.

- v. P.G. posted to each unit should write the case history examine the patients in detail and carry out the investigations and shall be responsible for pre operative, operative and post operative care. By the end of the unit posting, shall submit the same to the unit chief and take the signature.
 1. *Clinical cases*: Each M.D. student should present atleast 12 clinical cases for discussion in the two year posting (6 Obstetrics & 6 Gynaecology)
 2. *Journal club*: Each candidate shall present atleast 6 papers on recent advances in Obstetrics and Gynaecology from latest journals in the Journal clubs.
- They shall participate actively in minimum of 6 subject seminars.

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, and (iii) Clinical and operative skills.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a checklist similar to that used for seminar.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the logbook. (Table No.3, Chapter IV)

iv) *Periodic tests:*

The departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book-* Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

- viii) *Records:* Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The logbook is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the logbook. Collectively, logbooks are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format of the logbook for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

A. Theory

There shall be three question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I:	Basic Science as applicable to Obstetrics and Gynecology
Paper II:	Obstetrics
Paper III:	Gynecology

Note: The distribution of chapters / topics shown against the papers are suggestive only.

B. Clinical

There shall be two long cases and two short cases to be examined and presented by each candidate. Marks shall be 150.

Type of cases

Long cases: One case of Obstetrics and one case of Gynecology. Each case carries 50 marks.

Short cases: One case of Obstetrics and one case of Gynecology. Each case carries 25 marks.

C. Viva Voce: 50 Marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, dummies (pelvis, foetal skull), gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, NST etc., for interpretation.

D.

Maximum marks for Diploma in Obstetrics & Gynecology	Theory	Practical	Viva	Grand Total
	300	150	50	500

Recommended Books

Sl. No.	Name of the Author	Name of the Book	Edition	Name of the Publications
1.	IAN Donald	'Practical Obstetrics problems'	5th Edn.	B.A.Publication
2.	Farnandes Aris	'Practical guide to high risk pregnancy & delivery'		Mosbi Publications
3.	William's	'Text book of Obstetrics'	21 st Edn.	(not known)
4.	Holland	'Manual of Obstetrics'		B.I.P. Publications
5.	Jeffcoat's	'Principles of Gynaecology'	5 th Edn.	Butterworth Heighmen
6.	Shaw's	Text book of Gynaecology'	12 th Edn.	B.L. Cherchill livingston.
7.	Dutta	'Text book of Gynaecology'	2 nd Edn.	Central Publications.
8.	Parulekar	'Practical Gynaecology & Obstetrics'	Latest Edn.	Vora Publications
9.	Munrokar's	'Operative Obstetrics'	10 th Edn.	A.T.B.S. Publi.
10.	Telend's	'Operative Gynaecology'	8 th Edn.	Lipincorttriven Publications
11.	Barus or celil and Burrows	'Medical disorders in Obstetrics practice'	3 rd Edn.	Blackwell science Publications
12.	Rathnam	'Obstetrics and Gynaecology'	2 nd Edn.	Orientlongmen

13.	Arul kumar	'The management of labour	1 st Edn.	Publications Orientlongmen Publications
14.	Bhaskar Rao	'Clinical Gynaecology'	4 th Edn.	Publications Orientlongmen Publications
15.	C.S. Dawn	'Text books of Obstetrics and Neonatology'	13 th Edn.	B.B. Publications
16.	C.S. Dawn	'Text books of Gynaecology and contraception'	13 th Edn.	B.B. Publications
17.	J. Studd	'Progress in Obstetrics and Gynaecology	Latest Edn.	I.S.E. Publications
18.	Padubidri	'Text book of Obstetrics'	1 st Edn.	C.B.S. Publications

Journals

1. Journal of FOGSI
2. Clinics of Obstetrics & Gynecology- North America
3. Fertility and Sterility
4. British Journal of Obstetrics & Gynecology
5. American Journal of Obstetrics & Gynecology
6. American association of gynecology laproscopy
7. Obstetrics & Gynecologic clinic
8. Current opinion in Obstetrics & Gynecology
9. Briggs update: Drugs in pregnancy & lactation.
10. Operative technique in gynecologic surgery

Chapter III

Post Graduate Courses in Otorhinolaryngology

MS in Otorhinolaryngology

Goal

The goals of postgraduate training course would be to train a MBBS doctor who will:

- Practice efficiently and effectively, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education in the speciality irrespective of whether he is in a teaching institution or is a practicing surgeon.
- Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. Human values, Ethical practice and Communication abilities

Knowledge:

- Demonstrate understanding of basic sciences relevant to this specialty.
- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion
- Describe common malignancies in the country and their management including prevention
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.

- Update oneself by self study and by attending courses, conferences and seminars relevant to the speciality.
- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform common operative procedures in Otorhinolaryngology.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- Undertake complete patient monitoring including the preoperative and post operative care of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

i) Theory

1. Basic Sciences

Anatomy of the ear / physiology of hearing and equilibrium / Anatomy of nose and paranasal sinuses / Anatomy of pharynx oesophagus / Deglutition / Anatomy of larynx and tracheobronchial tree / Physiology of respiration / Physiology of generation and reception of speech. Surgical anatomy of skull base / Cranial nerves / Imaging and Radiology pertaining to ear, nose and throat (ENT) / Knowledge of Immunology and Microbiology as regarding ENT /

Radiotherapy and Chemotherapy in Head & Neck Cancers / Wound healing / Principles of Laser Surgery / Basics of anaesthesia and Intensive Care in relation to ENT / A thorough knowledge of anatomy of head and neck region including thyroid, neck spaces and salivary glands / Physiology of smell.

2. Audiology

(A)	(B)	(C)
a) Brief knowledge of acoustics	1) Epidemiology / Prevention / rehabilitation of balance & hearing disorders	1) Diagnostic audiometry
b) Use of computers in audiological and vestibular testing and rehabilitation	2) Hearing aids	2) Diagnostic testing of vestibular system
	3) Cochlear implants	

3. Otology

Diseases of ext. auditory canal and middle ear – Acute suppurative Otitis Media – CSOM.

Complications of CSOM - Plastic Surgery of ear – Otosclerosis – SN Loss in adults and children – vertigo – Meniere's disease – ototoxicity – vestibular Schwannoma – tumours of middle ear cleft – glomus jugulare – Disorders of facial nerve – Cochlear implants.

4. Laryngology

Acute & Chronic infections of oral cavity, pharynx, tonsils and larynx.

- Trauma & stenosis of larynx
- Management of obstructed airway and tracheostomy
- Disorders of voice
- Neurological affections of pharynx and larynx
- Pharyngeal pouch
- Tumours of larynx
- Angiofibroma and nasopharyngeal lesions

Tumours of oropharynx and lymphoma head and neck

Tumours of hypopharynx

Benign diseases of the neck

The thyroid gland and disorders

Diseases of salivary gland – neoplastic & non-neoplastic

Tumour of infra temporal fossa and parapharyngeal space. Cysts, granulomas and tumours of jaw, nose and sinuses.

The oesophagus in Otolaryngology, Facial Plastic Surgery and reconstructive surgery of head and neck

Terminal care of head and neck cancer

5. Rhinology

Radiology of Nose and Para nasal sinuses

- Congenital anomalies of the nose
- Conditions of external nose
- Abnormalities of smell
- Allergic rhinitis
- Intrinsic rhinitis and nasal polypi
- Infective rhinosinusitis / Complication and surgical management
- Disorders and trauma of facial skeleton
- Disorders of nasal septum
- CSF rhinorrhoea
- Epistaxis
- Snoring and sleep apnea
- Chronic granuloma's of nose and PNS
- The orbit in relation to ENT
- Transphenoidal hypophysectomy
- Overview of facial pain and headache

ii) Practical / Clinical

Mandatory:

Dissection of Head & Neck

10 temporal bone dissection which includes:

1. Cortical mastoidectomy
2. MRM & Radical mastoidectomy
3. Facial nerve decompression
4. Post tympanotomy
5. Labyrinthectomy
6. Endosymphetic sac decompression
7. Translabrynthine approach to IAM

iii) Essential list of Surgical Procedures

Following procedures are classified as : a) to be done independently (PI)

c) to assist a senior specialist /consultant (PA)

d) To wash and observe the procedure (O)

Otology

To be done independently (PI). The minimum number to be done is given against each procedures

Cortical mastoidectomy - 5 cases

MRM -

Radical mastoidectomy - 2 cases

Myringoplasty - 3

Myringotomy and Grommet insertion - 3 cases

Ossiculoplasty - one case

Facial N Decompression - optional

To have assisted or observed – Stapedectomy (PA/O)

1. Rhinology

To be done independently (PI)

- Reduction of fracture nasal bones - 1
- SMR - 7 cases
- Septoplasty - 2 cases
- Diagnostic nasal endoscopy - 5 cases
- FESS
 - a) Uncinectomy
 - b) Polypectomy - 2 cases
 - c) Anterioethmoidal cell clearance
 - d) Middle meatal antrostomy
- Caldwell Luc - 1 case
- Antral lavage - 10 cases
- Intranasal antrostomy - 5 cases

To Assist or observe:

- FESS – Postr. Ethmoid / sphenoid / frontal sinus surgery
- Maxillo facial surgeries
- External operations of frontoethmoid sinus
- Maxillectomy - Total
 - Partial

2. Laryngology Head and Neck

To be done independently (PI)

- Tracheostomy - 2 cases
- Tonsillectomy - 10 cases
- Adenoidectomy - 2 cases
- DL Scopy - 10 cases
- Oesophagoscopy / Upper oesophagus foreign body removal - 5 cases

To Assist or observe

- Bronchoscopy
- Total / Partial laryngectomy
- Block dissections of neck
- Thyroid surgery
- Salivary gland surgery
- Microlaryngeal surgery

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. Lectures: Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

- a) Didactic Lectures: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library
- 3) Research Methods
- 4) Medical code of Conduct and Medical Ethics
- 5) National Health and Disease Control Programmes
- 6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

- b) Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. Journal Club: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See

Checklist in Chapter IV). A time table with with names of the student and the moderator should be announced in advance.

3. Subject Seminar: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be announced in advance.
4. Dissection Head and Neck
Temporal bone dissection which includes:
 - Cortical mastoidectomy
 - MRM and Radical mastoidectomy
 - Facial nerve decompression
 - Posterior tympanotomy
 - Labyrinthectomy
 - Endosympathetic sac decompression
5. Ward Rounds: Ward rounds may be service or teaching rounds.
 - a) Service Rounds: Postgraduate and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) Teaching Rounds: Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries (a) and (b) should be made in the Log book.
6. Clinico-pathological Conference: Recommended at least once in three months for all post graduate Students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
7. Clinical cases (minimum of 40 cases) to be presented, which will be assessed by using Check lists (See Chapter IV)
8. Inter-departmental Meetings: With departments of Pathology and Radio-Diagnosis at least once a week. Radio-diagnosis: Interesting cases and the imaging modalities should be discussed. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

9. Teaching Skills: Post graduate students must teach under graduate students (Eg. Medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. (See model check list in Chapter IV). Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.
10. Continuing Medical Education Programmes (CME) : Recommended that at least 2 state level CME programmes should be attended by each student in 3 Years.
11. Conferences: Attending conferences is optional. However it is encouraged.

Dissertation

1. Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
2. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
3. Every candidate shall submit to the Registrar (Academic) of RGUHS in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
4. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.
5. The dissertation should be written under the following headings:
 - i. Introduction
 - ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion

- vii. Conclusion
 - viii. Summary
 - ix. References (Vancouver style)
 - x. Tables
 - xi. Annexures
6. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.
 7. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.
 8. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
 9. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Rotation posting in other Departments

Neurosurgery	4 weeks
Plastic Surgery	4 weeks
Head & Neck Oncology	4 weeks
Anesthesia	2 weeks
Cardio-thoracic Surgery	2 weeks (optional)
Speech & Hearing*	2 weeks

*Recommended Centres for Speech & Hearing:

- a) All India Institute of Speech & Hearing, Mysore
- b) National Institute of Mental Health and Neuro Sciences (NIMHANS)
- c) Institute of Speech & Hearing, Lingarajpuram, Bangalore

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff

of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trustworthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

(iv) *Teaching skills* : Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

(v) *Dissertation in the Department* : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

(vi) *Work diary / Log Book* - Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.

(vii) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be

held three months before the final examination. The tests may include written papers practicals / clinicals and viva voce.

(viii) **Records** : Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV, Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

i) Theory

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I:	Basic Sciences - 1. Anatomy 2. Physiology 3. Other basic science topics covered in syllabus	100 marks
Paper II:	Rhinology including recent advances	100 marks
Paper III:	Otology including recent advances	100 marks
Paper IV:	Laryngology and pharyngology & Broncho-oesophagology including recent advances	100 marks

Note: The distribution of chapters / topics shown against the papers are suggestive only.

ii) *Clinical* 200 marks

There shall be one long case and three short cases to be examined and presented by each candidate.

Type of cases

Long case 1 80 marks

Short cases 3 (40x3) 120 marks

iii) *Viva voce* 100 marks

1) Viva-voce Examination: (80 marks)

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, Histo pathology slides, X-rays, ultrasound, CT scan images, Temporal bone dissection, etc., for interpretation. Questions on operative surgery and use of instruments will be asked. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

Maximum marks for	Theory	Practical	Viva	Grand Total
M.S Otorhinolaringology	400	200	100	700

Recommended Books

Name of the Book	Year	Edition	Publisher	Cost
1. Scott Broun 6 volumes	1996	Sixth	Buterorth & Co Ltd.	11000/-
2. Cummins 5 volumes Otolaryngology, Head and Neck Surgery	1998	Third	Mosby	\$495.00
3. Rob and Smith Operations surgery pertaining to ENT				
4. Paperalla Otolaryngology (4 Vol set)	1991	Third	W.B. Saunder's Company	\$450.00
5. Logan & Turner Diseases of ENT	1988	Tenth	Wright / Varghese	425/-
6. Lore Atlas of Head and Neck Surgery	1988	Third	W.B. Saunder's Company	\$125.00
7. Shambagh / Glasscock Surgery of the Ear	1990	Fourth	W.B. Saunder's Company	\$125.00
8. Ballenger Snow Jr.	1996	Fifteenth	Williams & Wilkins	\$95.00

Journals

- 1) The Laryngoscope – loppincott williams & william
- 2) Indian Journal of Otolaryngology – AOI.
- 3) Annals of Otology / Rhinology / laringology – Annals Publishing Co.
- 4) Archives of Otorhinolaryngology
- 5) British Journal of Otolaryngology
- 6) Indian Journal of Otology .
- 7) Recent advances in Otorhinolaryngology - MOSBY
- 8) The Otolaryngology Clinics of North America – WB Saunders Company

Diploma in Otorhinolaryngology (DLO)

Goals

The goals of postgraduate training course would be to train a MBBS doctor who will:
Practice efficiently and effectively the speciality, backed by scientific knowledge and skill base. Exercise empathy and a caring attitude and maintain high ethical standards. Continue to evince keen interest in continuing education in the speciality. Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. Human values, Ethical practice and Communication abilities

Knowledge:

- Demonstrate understanding of basic sciences relevant to general surgery
- Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion
- Describe common malignancies in the country and their management including prevention
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Update himself by self study and by attending courses, conferences and seminars relevant to surgery.
- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform common operative procedures in ENT.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- Undertake complete patient monitoring including the preoperative and postoperative care of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

i) Theory

1. Basic Sciences

Anatomy of the ear / physiology of hearing and equilibrium / Anatomy of nose and paranasal sinuses / Anatomy of pharynx oesophagus / Deglutition / Anatomy of larynx and tracheobronchial tree / Physiology of respiration / Physiology of generation and reception of speech. Surgical anatomy of skull base / Cranial nerves / Imaging and Radiology pertaining to ear, nose and throat (ENT) / Knowledge of Immunology and Microbiology as regarding ENT / Radiotherapy and Chemotherapy in Head & Neck Cancers / Wound healing / Principles of Laser Surgery / Basics of anaesthesia and Intensive Care in relation to ENT / A thorough knowledge of anatomy of head and neck region including thyroid, neck spaces and salivary glands / Physiology of smell.

2. Audiology

(A)	(B)	(C)
a) Brief knowledge of acoustics	1) Epidemiology / Prevention / rehabilitation of balance & hearing disorders	1) Diagnostic audiometry
b) Use of computers in audiological and vestibular testing and rehabilitation	2) Hearing aids 3) Cochlear implants	2) Diagnostic testing of vestibular system

3. Otology

Diseases of ext. auditory canal and middle ear – Acute suppurative Otitis Media – CSOM.

Complications of CSOM - Plastic Surgery of ear – Otosclerosis – SN Loss in adults and children – vertigo – Meniere's disease – ototoxicity – vestibular Schwannoma – tumours of middle ear cleft – glomus jugulare – Disorders of facial nerve – Cochlear implants.

4. Laryngology

Acute and Chronic infections of oral cavity, pharynx, tonsils and larynx.

- Trauma & stenosis of larynx
- Management of obstructed airway and tracheostomy
- Disorders of voice
- Neurological affections of pharynx and larynx
- Pharyngeal pouch
- Tumours of larynx
- Angiofibroma and nasopharyngeal lesions

Tumours of oropharynx and lymphoma head and neck

Tumours of hypopharynx

Benign diseases of the neck

The thyroid gland and disorders

Diseases of salivary gland – neoplastic & non-neoplastic

Tumour of infra temporal fossa and parapharyngeal space. Cysts, granulomas and tumours of jaw, nose and sinuses.

The oesophagus in Otolaryngology, Facial Plastic Surgery and reconstructive surgery of head and neck

Terminal care of head and neck cancer

5. Rhinology

Radiology of Nose and Para nasal sinuses

- Congenital anomalies of the nose
- Conditions of external nose
- Abnormalities of smell
- Allergic rhinitis
- Intrinsic rhinitis and nasal polypi
- Infective rhinosinusitis / Complication and surgical management
- Disorders and trauma of facial skeleton
- Disorders of nasal septum
- CSF rhinorrhoea
- Epistaxis
- Snoring and sleep apnea
- Chronic granuloma's of nose and PNS
- The orbit in relation to ENT
- Transphenoidal hypophysectomy
- Overview of facial pain and headache

ii) **Practical / Clinical - Mandatory:** Dissection of Head & Neck and 10 temporal bone dissection which include:

1. Cortical mastoidectomy
2. MRM & Radical mastoidectomy
3. Facial nerve decompression
4. Post tympanotomy
5. Labyrinthectomy
6. Endosymphetic sac decompression
7. Translabyrinthine approach to IAM

iii) Essential list of Surgical Procedures

Following procedures are classified as :

- a) To be done independently (PI)
- b) To assist a senior specialist / consultant (PA)
- c) To wash and observe a senior (O)

Otology

To be done independently (PI)

Cortical mastoidectomy -2 cases

To wash and observe a senior (O)

MRM

Radical mastoidectomy - one case

Myringoplasty -

Myringotomy and Grommet insertion - 2 cases

To assist a senior specialist / consultant (PA)

Ossiculoplasty

Facial N Decompression

Stapedectomy (PA/O)

1. Rhinology

To have done independently (PI)

- Reduction of fracture nasal bones - 2 cases
- SMR - 5 cases
- Septoplasty - 2 cases
- Diagnostic nasal endoscopy
- FESS
 - a) Uncinectomy
 - b) Polypectomy
 - c) Anterioethmoidal cell clearance
 - d) Middle meatal antrostomy
- Caldwell Luc - one case
- Antral lavage - 5 cases
- Intranasal antrostomy

To Assist or observe:

- FESS – Postr. Ethmoid / sphenoid / frontal sinus surgery
- Maxillo facial surgeries
- External operations of frontoethmoid sinus
- Maxillectomy - Total
 - Partial

2. Laryngology Head and Neck

To have done independently (PI)

- Tracheostomy - 2 cases
- Tonsillectomy - 5 cases
- Adenoidectomy - 5 cases
- DL Scopy - 7 cases
- Oesophagoscopy / Upper oesophagus foreign body removal - 4 cases

To Assist or observe

- Bronchoscopy
- Total / Partial laryngectomy
- Block dissections of neck

d) To wash and observe a senior (O)

- Thyroid surgery
- Salivary gland surgery
- Microlaryngeal surgery

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a **full time student**. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined in course contents is given below.

1. *Lectures*: Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) *Didactic Lectures*: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library
- 3) Medical code of Conduct and Medical Ethics
- 4) National Health and Disease Control Programmes
- 5) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. *Journal Club*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least three times a year and a total of 6 seminar presentations in two years. The presentations would be evaluated using check lists and would carry weightage for internal assessment. (See Checklist in Chapter IV). A time table with names of the student and the moderator should be announced in advance.

3. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics as least three times a year and a total of 6 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be announced in advance.

4. Dissection Head and Neck

Temporal bone dissection which includes:

- Cortical mastoidectomy
- MRM and Radical mastoidectomy
- Facial nerve decompression
- Posterior tympanotomy
- Labrintectomy
- Endosympathetic sac decompression

5. Out patient clinics and operative work.

6. *Ward Rounds*: Ward rounds may be service or teaching rounds.

- (a) *Service Rounds*: Postgraduate and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
- (b) *Teaching Rounds*: Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries (a) and (b) should be made in the Log book.

7. Clinical cases seen (minimum of 40 cases). Clinical case presentations: Candidates should periodically present cases. The presentations will be assessed using check lists (See Chapter IV).

8. *Clinico-pathological Conference*: Recommended at least once in three months for all post graduate Students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

9. *Inter-departmental Meetings*: Strongly recommended particularly with departments of pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

10. *Radio-diagnosis*: Interesting cases and the imaging modalities should be discussed.

11. Continuing Medical Education Programmes (CME) : Recommended that at least one state level CME programmes should be attended by each student in 2 years.

12. *Conferences*: Attending conferences is optional. However it is encouraged.

Rotation posting in other Departments

Neurosurgery	4 weeks
Plastic Surgery	2 weeks
Head & Neck Oncology	4 weeks
Speech & Hearing*	2 weeks
Anesthesiology	2 weeks

*Recommended Centres for Speech & Hearing:

- a) All India Institute of Speech & Hearing, Mysore
- b) National Institute of Mental Health and Neuro Sciences (NIMHANS)
- c) Institute of Speech & Hearing , Lingarajpuram, Bangalore

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, and (iii) Clinical and operative skills.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to

be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

- iii) *Journal Review Meeting (Journal Club)*: The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)
- iv) *Seminars / Symposia*: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV).
- v) *Clinico-pathological conferences* : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.
- vi) *Day to Day work* : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).
- vii) *Clinical meetings* : Candidates should periodically present clinical cases to faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).
- viii) *Clinical and Procedural skills* : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)
- (v) *Periodic tests*: The departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.
- (vi) *Work diary / Log Book*- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.
- (vii) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

List of surgeries / must include basic surgeries as indicated as compulsory criteria for completion of degree / diploma programme / may also include other surgical procedures.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

i) Theory

There shall be three question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I:	Rhinology including basic sciences and recent advances	100 marks
Paper II:	Otology including basic sciences and recent advances	100 marks
Paper III:	Laryngology and pharyngology & Broncho-oesophagology including basic sciences and recent advances	100 marks

Note: The distribution of chapters / topics shown against the papers are suggestive only.

ii) Clinical

150 marks

There shall be one long case and two short cases to be examined and presented by each candidate.

Type of cases

Long case 1 70 marks

Short cases 2 (40x2) 80 marks

iii) *Viva voce* : 50 marks

All examiners will conduct viva-voice conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, Histo pathology slides, X-rays, ultrasound, CT scan images, Temporal bone dissection, etc., for interpretation. Questions on operative surgery and use of instruments will be asked.

Maximum marks for	Theory	Practical	Viva	Grand Total
Dip. Otorhinolaryngology	300	150	50	500

Recommended Books

Name of the Book	Year	Edition	Publisher	Cost
1. Scott Broun 6 volumes	1996	Sixth	Buterorth & Co Ltd.	11000/-
2. Cummins 5 volumes Otolaryngology, Head and Neck Surgery	1998	Third	Mosby	\$495.00
3. Rob & Smith Operations surgery pertaining to ENT				
4. Paperalla Otolaryngology (4 Vol set)	1991	Third	W.B. Saunder's Company	\$450.00
5. Logan and Turner Diseases of ENT	1988	Tenth	Wright / Varghese	425/-
6. Lore Atlas of Head and Neck Surgery	1988	Third	W.B. Saunder's Company	\$125.00
7. Shambagh / Glasscock Surgery of the Ear	1990	Fourth	W.B. Saunder's Company	\$125.00
8. Ballenger Snow Jr.	1996	Fifteenth	Williams & Wilkins	\$95.00

Journals

- 1) The Laryngoscope – loppincott Williams & William
- 2) Indian Journal of Otolaryngology – AOI.
- 3) Annals of Otology / Rhinology / laringology – Annals Publishing Co.
- 4) Archives of Otorhinolaryngology
- 5) British Journal of Otolaryngology
- 6) Indian Journal of Otology .
- 7) Recent advances in Otorhinolaryngology - MOSBY
- 8) The Otolaryngology Clinics of North America – WB Saunders Company

Chapter III

Postgraduate Curricula in Ophthalmology M. S. Ophthalmology

Goal :

The Master's Course in Ophthalmology is a 3-year integrated course, after satisfactory completion of which the candidate shall be able to practice ophthalmology competently and safely in the community that he/she serves

Objectives of the course: With the knowledge and skills developed at the completion of the course, the candidate shall be able to:

1. offer to the community, the current quality of 'standard of care' in ophthalmic diagnosis as well as therapeutics, medical or surgical, for common as well as referred conditions.
2. periodically self assess his or her performance and keep abreast with ongoing advances in the field and apply the same in his /her practice.
3. be aware of his or her own limitations to the application of the specialty in situations which warrant referral to major centers or individuals more qualified to treat.
4. apply research and epidemiological methods during his / her practice. The candidate shall be able to present or publish work done by him/her.
5. contribute as an individual/or in a group or institution towards the fulfillment of national objectives with regard to prevention of blindness.
6. effectively communicate with patients or relatives so as to educate them sufficiently and give them the full benefit of informed consent to treatment and ensure compliance.
7. effectively communicate with colleagues.

Course Contents

Essential theoretical knowledge

These are only broad guidelines and are illustrative, there may be overlap between sections.

a. The Basic Sciences :

i. Orbital and Ocular anatomy

a. Gross anatomy

b. Histology

ii. Ocular Physiology

iii. Pathology

a. General pathology

b. Ocular pathology : Gross pathology, Histopathology.

- iv. Biochemistry: General biochemistry, Biochemistry applicable to ocular function.
- v. Microbiology
 - a. General Microbiology
 - b. Specific microbiology applicable to the eye
 - c. Immunology with particular reference to ocular immunology
- vi. Geometric and ophthalmic optics
 - a. Basic physical optics
 - b. Ophthalmic optics
 - c. Applied optics including optical devices
- b. Clinical Ophthalmology
 - i. Disorders of Refraction
 - vi. Disorders of the Lids
 - vii. Disorders of the Lacrimal System
 - viii. Disorders of the Conjunctiva
 - ix. Disorders of the Sclera
 - x. Disorders of the Cornea
 - xi. Disorders of the Uveal Tract
 - xii. Disorders of the Lens
 - xiii. Disorders of the Retina
 - xiv. Disorders of the Optic Nerve & Visual Pathway
 - xv. Disorders of the Orbit
 - xvi. Glaucoma
 - xvii. Neuro ophthalmology
 - xviii. Paediatric ophthalmology
 - xix. Systemic ophthalmology (Ocular involvement in systemic disease)
 - xx. Immune ocular disorders
 - xxi. Strabismus & Amblyopia

Essential diagnostic skills - instrumentation

- **Tonometry**
 - i. Applanation
 - ii. Indentation (commonly Schiotz)
-
- **Assessment of epiphora**
 - i. Jone's dye test
 - ii. Syringing – performance & interpretation
-
- **Dry eye evaluation**
 - i. Schirmer test
 - ii. Rose Bengal staining

- iii. Tear film breakup time
- iv. Tear meniscus evaluation
-
- **Corneal ulceration**
 - i. Taking a corneal scraping
 - ii. Inoculation into media
 - iii. Evaluation of Gram's stain
 - iv. Evaluation of KOH preparation
 - v. Corneal wedge biopsy
-
- **Direct ophthalmoscopy**
 - i. Distant direct
 - ii. Media assessment
 - iii. Use of filters provided
-
- **Indirect ophthalmoscopy**
 - i. Scleral depression
 - ii. Fundus drawing capability
 - iii. Use of filters provided
-
- **Slit Lamp Examination**
 - i. Diffuse examination
 - ii. Focal examination
 - iii. Retroillumination – direct & indirect
 - iv. Sclerotic scatter
 - v. Specular reflection
 - vi. Staining modalities and interpretation
-
- **Slit Lamp Accessories:**
 - i. Applanation Tonometry
 - 1. Goldman's applanation
 - ii. Gonioscopy
 - 1. Single mirror gonioscope
 - 2. Gonioprism
 - 3. Grading of the angle
 - 4. Testing for occludability
 - 5. Indentation gonioscopy
 - iii. 3-mirror examination of the fundus
 - iv. 78-D / 90-D / 60-D examination
 - v. Hruby lens examination
 - vi. Optical pachymetry
 - vii. Slit lamp photography
-

- **Colour vision evaluation**
 - i. **Ishihara pseudoisochromatic plates**
 - ii. **Other tests including**
 - 1. Farnsworth – Munsell 100 – hue or 15 – hue tests
 - 2. Holmgren's wools
 - 3. Edridge –Green lantern
- **Use of Amsler's charting**
 - i. **Instructing in the use of and interpreting the chart.**
- **Corneal topography and corneal mapping**
 - i. **Interpretation of corneal topography mapping**
- **Specular microscopy of the corneal endothelium**
- **Keratometry**
 - i. **Performance & interpretation of keratometry**
 - ii. **Diagnosis of situations such as keratoconus**
 - iii. **Keratotomy**
- **Fundus photography & fundus fluorescein angiography (FFA, FAG)**
 - i. **Doing and evaluating stereoscopic fundus photographs**
 - ii. **Performance of and interpretation of FFA**
 - iii. **Performance of indirect fluorescein angioscopy**
- **Refraction**
 - i. **Retinoscopy**
 - ii. **Streak Retinoscopy**
 - iii. **Use of trial set**
 - iv. **Use of Jackson's cross-cylinder**
 - v. **Subjective and objective refraction**
- **Autorefractometry**
 - i. **Use of and interpretation of autorefractometer**
- **Diagnosis & assessment of Squint**
 - i. **Ocular position and motility examination**
 - ii. **Versions, ductions, and vergences**
 - iii. **Convergence facility estimation**
 - iv. **Cover / Uncover / Alternate cover test**
 - v. **Use of prism bars or free prisms in assessment of squint**
 - vi. **Use of synaptophore / major amblyoscope**
 - vii. **Use of Bagolini's striated glasses / red filters / Maddox rod**

- viii. **Use of Worth's four dot test**
- ix. **Use of minor amblyoscope**
- x. **Use & interpretation of the Hess chart / Lees' screen**
- xi. **Performance & interpretation of diplopia charting**
- xii. **Diagnosis of amblyopia**
- **Exophthalmometry**
 - i. **Use of H ertel's exophthalmometer**
 - ii. **Use of Luedde's exophthalmometer**
 - iii. **Use of other exophthalmometers**
 - iv. **Measurement of proptosis or exophthalmos**
- **Use and evaluation of ophthalmic ultrasound**
 - i. **A- scan ultrasound with biometry**
 - ii. **B- scan ultrasound : performance & interpretation**
- **Interpretation of perimetry**
 - i. **Tangent screening**
 - ii. **Goldman perimeter & interpretation**
 - iii. **Static computerized perimetry**
 - 1. **Interpretation of commonly managed problems**
- **Radiology**
 - i. **Interpretation of plain skull films**
 - 1. **PA-20 (Caldwell's view)**
 - 2. **PNS (Water's view)**
 - 3. **Lateral**
 - 4. **Submentovertical**
 - 5. **Optic canal views**
 - 6. **Localisation of intra ocular and intra orbital FBs**
 - ii. **Interpretations of contrast studies**
 - 1. **Performance & interpretation of dacryocystograms**
 - 2. **Performance and interpretations of orbital venograms**
 - 3. **Interpretation of carotid angiograms**
 - iii. **Interpretation of CT – Scans & MRI Scans**
 - 1. **Orbital CT interpretation & orbital MRI evaluation**
 - 2. **Brain CT interpretation**

Essential surgical skills

Procedure	Nature of activity * & number			
	O	A	PA	PI
1. Operating theatre				
a. Anaesthesia :				
i. Retrobulbar anaesthesia	-	-	20	20
ii. Peribulbar anaesthesia	-	-	20	20
iii. Parabulbar anaesthesia	✓	-	-	-
iv. Facial blocks				
• O'Brein	-	-	-	20
• Atkinson	-	-	-	5
• van Lint & modifications	-	-	-	5
v. Frontal blocks	-	-	-	2
vi. Infra orbital blocks	-	-	-	1
vii. Blocks for sac surgery	-	-	-	5
b. Magnification :				
i. Operating microscope : Familiarity with use is essential	-	-	-	✓
ii. Operating loupe				
c. Lid surgery:				
i. Tarsorrhaphy	-	-	-	10
ii. Ectropion and entropion procedures	-	-	-	2
iii. Ptosis surgery	-	2	-	-
iv. Lid repair following trauma and surgical excision of lid for tumours etc.	-	-	2	-
v. Epilation, electrolysis, cryotherapy etc.	-	-	-	10
d. Destructive procedures:				
i. Evisceration with or without implant	-	-	-	3
ii. Enucleation with or without implant	-	-	-	5
iii. Modified enucleation procedures for intraocular tumours		-	1	-
e. Sac surgery				
i. Dacrocystectomy	-	-	-	2

Procedure	Nature of activity * & number			
	O	A	PA	PI
ii. Dacryocystorhinostomy	-	-	-	3
iii. Probing for congenital obstruction of nasolacrimal duct	-	-	1	-
f. Extraocular muscle surgery				
i. Recession and resection procedures on the horizontal recti	-	-	2	-
g. Cataract surgery				
i. Standard ECCE with or without IOL implantation.	-	-	-	10
ii. Small incision ECCE with or without IOL implantation	✓			
iii. Membranectomy	✓			
iv. Secondary AC or PC IOL implantation	✓			
v. Phacoemulsification	✓			
vi. Intra capsular cataract extraction	✓			
vii. Vectis extraction		-	1	-
h. Retinal surgery				
i. Needs to know how to assist in external procedures such as buckling	-	1	-	-
ii. Prophylactic cryotherapy	✓	-	-	-
i. Orbit surgery				
i. Anterior orbitotomy for diagnostics and therapy	✓	-	-	-
ii. Lateral orbitotomy for tumours	✓	-	-	-
iii. Incision and drainage via anterior orbitotomy for abscess	-	1	-	-
iv. Exenteration	✓	-	-	-
v. Fine needle aspiration biopsy of orbital disease	✓	-	-	-
(if experienced pathologist is available)				
j. Vitrectomy				

Procedure	Nature of activity * & number			
	O	A	PA	PI
i. Intra vitreal and intra cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitis management.	-	-	2	-
ii. Needs to know the basics of open sky vitrectomy (anterior segment) as management of cataract surgery complication	-	-	-	2
iii. Automated vitrectomy	✓			
iv. Assist vitrectomy surgeon if facility exists.				
k. Keratoplasty				
i. Assisting or doing penetrating keratoplasty (therapeutic, optical)	-	-	1	-
ii. Lamellar keratectomy	✓	-	-	-
l. Glaucoma surgery				
i. Trabeculectomy	-	-	-	3
ii. Pharmacological modifications of trabeculectomy				
iii. Goniotomy				
iv. Cyclocryotherapy and other cyclodestructive procedures	-	-	-	2
m. Surface ocular procedures				
i. Pterygium excision with modifications	-	-	-	5
ii. Conjunctival grafting	-	-	2	-
iii. Biopsy of cornea and conjunctiva	-	-	-	1
n. Pterygium excision	-	-	-	10
o. Tarsorrhaphy	-	-	-	10
p. Retrobulbar, parabolbar anaesthesia	-	-	-	20
2. Outpatient :				
a. Manual diagnostic procedures such as syringing, corneal scraping, conjunctival swab collection, conjunctival scraping etc.	-	-	-	10

Procedure	Nature of activity * & number			
	O	A	PA	PI
b. Conjunctival and corneal foreign body removal on the slit lamp	-	-	-	10
c. Chalazion incision and curettage	-	-	-	10
d. Biopsy of small lid and tumours	-	-	3	-
e. Suture removal skin, conjunctival, corneal, and corneoscleral	-	-	-	5
f. Subconjunctival injection	-	-	-	10
g. Posterior Sub-Tenon's injections	-	-	-	5
h. Artificial eye fitting	-	-	-	5
i. Laser procedures	✓	-	-	-
i. Laser capsulotomy	✓	-	-	-
ii. Laser iridotomy	✓	-	-	-
iii. Laser trabeculoplasty	✓	-	-	-
iv. Panretinal photocoagulation	✓	-	-	-
v. Focal photocoagulation	✓	-	-	-

* The procedures that the student should have:

O = Washed and Observed

A = Assisted the operating surgeon

PA = Performed with Assistance

PI = Performed Independently

Essential Research Skills

1. Basic statistical knowledge
 - a. Ability to undertake clinical & basic research
 - b. Descriptive and Inferential statistics
 - c. Ability to publish results of one's work
2. Ability to constructively criticize publications in the field and without
3. This could be achieved during the course by attending workshops on Research Methodology, basic statistics classes and regularly having Journal Clubs etc. where selected articles could be taken and evaluated for content quality and presentation.

Other skills required

1. Contact lenses
 - a. Assessment
 - b. RGP fitting
 - c. Soft lens fitting
 - d. Troubleshooting
2. Subjective correction of refraction
 - a. Techniques of subjective correction

- b. Knowledge of basic optical devices available and relative advantages and disadvantages of each.
- 3. Low vision aids
 - a. The basics of fitting with knowledge of availability & cost
- 4. Community ophthalmology
 - a. Ability to organize institutional screening
 - b. Ability to organize peripheral eye screening camps
 - c. Knowledge and ability to execute guidelines of National Program for Prevention of Blindness
- 5. Presentation
 - a. Ability to present one's work effectively at various scientific for a particularly free papers in scientific conferences within allotted framework of time
- 6. Organisation
 - a. Ability to organize meetings, seminars and symposia
 - b. Ability to get along with colleagues and work as a team with the other members of the department.
 - c. Ability to interact with and work as a team with other disciplines that may exist in the same hospital.
- 7. Communication skills
 - a. With patients
 - b. With colleagues
- 8. Record keeping
 - a. The ability to maintain records as scientifically as possible
 - b. Knowledge of computer software is helpful
- 9. Teaching
 - a. The ability to pass on skills acquired to one's juniors, theoretical, procedural and surgical

Year – wise structured training schedule

First year :

- 1. Theoretical knowledge**
 - a. Basic sciences should be addressed during this period
 - b. It is useful to have an internal examination of the basic sciences at the end of the first year, which will decide appearance at the final examination.
 - c. Clinical ophthalmology.
- 2. Clinical examination and diagnostics**
 - a. The basics of history taking, order and correct methods of examination and recording have to be learnt during this time.
 - b. Clinical and surgical decision making is encouraged under supervision.

3. Diagnostics

- a. All procedures in bold should as far as possible be done and the student should be fairly conversant with most of the techniques marked in bold.

4. Surgery

- a. Extra ocular surgery including
 - i. Destructive procedures must have been done independently with or without assistance
 - ii. Local Anaesthesia (retrobulbar and peribulbar blocks)
 - iii. Subconjunctival injections
 - iv. Assisting for squint surgery
 - v. Assisting for lid surgery. Tarsorrhaphy should be performed independently as also the simpler oculoplastic procedures.
 - vi. Chalazion and Pterygium surgery.
 - vii. Lid and corneal foreign body removal, suture removal on the slit lamp etc.
 - viii. At the end of the first year, the student should have participated as assistant in most of the intra ocular procedures as an assistant.
 - ix. Cataract surgery :
 - 1. Cataract surgery should be approached in stages, emphasis to be given on microscopic surgery.
 - 2. At the end of the first year, the student should be able to do standard extracapsular cataract extraction at least under guidance.

Second year :

1. Theoretical Knowledge :

- a. Here stress will be laid on clinical ophthalmology

2. Clinical examination and diagnostics

- a. The student is encouraged to take diagnostic investigational and therapeutic decisions on his / own. He / she should be able to manage most of the common problems that arise without guidance. However, the degree of freedom allowed in decision making is left to the confidence of the teacher in the student's abilities. It is to be encouraged. May require guidance for more complex cases.

3. Diagnostics

- a. The student should be conversant and at ease with most if not all the diagnostic procedures outlined in bold. Other procedures are optional skills if facility is available in the department. This is particularly so for the Master's candidate. However, as far as

possible, it is advisable to make all such facility available in the department.

4. Surgical skills

- a. At the end of the second year , the student should be capable of operating, without assistance, but under supervision, all varieties of cataract except congenital cataract. He / she should also know the management of cataract induced complications and cataract surgical complications (management of vitreous loss).
- b. He/she should have performed the basic antiglaucoma procedures such as trabeculectomy either with assistance or under supervision
- c. Extra ocular surgery such as squint surgery could be performed with assistance.
- d. In addition, lacrimal sac surgery such as dacryocystectomy and dacryocystorhinostomy should be possible with assistance or under supervision.
- e. In addition, the Master's candidate should ideally have assisted in the other surgery such as retinal surgery, vitrectomy, orbit surgery, advanced oculoplastic surgery etc.

5. Conferences and workshops

- a. The candidate should have attended one or two regional workshops and one national conference if possible. Presentation of a free paper at these venues is to be encouraged.

Third year :

1. Theoretical knowledge :

- a. Should be thorough with basic clinical ophthalmology with extensive and intensive reading

2. Clinical examination and diagnostics

- a. Should be conversant with all aspects of clinical examination and decision making. Independent decision making and investigational and management freedom should be given at this stage for the more usual situations. However, complex cases could be discussed with consultant and degree of freedom of decision making is left to the consultant's discretion.

3. Surgical skills

- a. Routine skills are honed during this period.
- b. Cataract surgery should be done independently without supervision or assistance.
- c. Antiglaucoma surgery may be done.

- d. Can assist other procedures such as Retinal surgery, orbit surgery etc. The choice of doing the surgery with assistance and supervision should be left to the discretion of the consultant.

4. Conferences and workshops

- a. The candidate by this time should have attended at least one national conference. He / she should be given time off to attend regional workshops and conferences particularly those dealing with the state of art.

Rotation and Posting in other Departments

In institutions where subspecialties are not being usually performed, (eg. VR surgery, orbit surgery etc.), students could be deputed for a month or so in institutions in which these specialities are highly developed.

For an MS student, optional rotation postings to allied departments would include

Plastic Surgery
Neurology / Neurosurgery
Intensive Care
ENT

However, posting to these allied specialities would depend upon the head of department's discretion. The total duration of posting should not exceed 4 months.

Teaching-Learning Activities

1. Clinical Case discussions

- a. Every effort should be made to include as wide a variety of cases as possible over two years with multiple repetitions.
- b. Case discussions on the patient's records written by the student is to be encouraged as it helps exercise the student's diagnostic and decision making skills.
- c. Case presentation at other in-hospital multidisciplinary fora may be done.

2. Seminars

- a. Seminars should be conducted at least once weekly. The topics selected should be repeated once in 2 years so as to cover as wide a range of topics as possible.
- b. Seminars could be individual presentations or a continuum (large topic) with many candidates participating.
- c. Each candidate shall present at least four seminar a year and a total of 12 seminars in 3 years

3. Journal Clubs

- a. This also should be a once a week or once in two week exercise. The topics selected should be current. It could be done topic wise or journal wise. Indexed journals are recommended.
- b. Each candidate shall present journals allotted at least four times in a year and a total of 12 such presentations be made in 3 years

4. CPC

Clinico pathological exercises (CPCs), are useful and should be done.

5. Lectures

- a) Lectures to candidates should be in the form of instructional courses at the beginning of the academic term. These would include topics such as dark room techniques, fundus fluorescein angiography, evaluation of perimetry, squint evaluation and management, slit lamp examination with accessories such as gonioscopy etc.
- b) Lectures could also be arranged round the year on subspecialty topics.
- c) During the course, the candidates should have one lecture / one seminar on National programs (eg. National Programme for Control of Blindness, Trachoma program etc.), International assistance schemes for execution of national program (DAN-PCB , Lion's International, Christoffel-Blunden Mission etc). These would be addressed to in detail, including current status etc.. In addition, it would be useful to include a few lectures on other non-ophthalmic National programs being undertaken in the country.

6. Research Activities

A candidate should learn to be conversant with journal browsing, medline search etc. to help in project and clinical and research work.

7. Dissertation & research meetings:

Departmental meetings should be held to overview research work done, particularly satisfactory conduct and progress of dissertation topics. These could be conducted once in 3 months either as an additional activity or in lieu of a journal club.

8. Teaching skills:

Every postgraduate student should be involved in undergraduate teaching also. One or two theory classes for undergraduates could be attended and one or two theory classes could be taken for undergraduates for selected topics. Undergraduate clinical teaching is another teaching skill that the student should pick up during the course. At least five to six undergraduate clinical classes should be taken by the final year student (MS) before his/her course is over. This may be supervised by a consultant if necessary.

9. Orientation program:

All postgraduates from all specialties should have an introductory program in the institution where they are informed about candidate responsibilities, working systems, library usage, lab protocols etc.

Specific orientation regarding the departmental working could be made as an introductory talk in the department concerned.

10. Dissertation:

Every candidate pursuing MD degree course in Anaesthesiology is required to carry out work on a selected research project under the guidance of recognised postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

1. The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
2. Every candidate shall submit to University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
3. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No changes in the dissertation topic or guide shall be made without prior approval of the University.
4. The dissertation should be written under the following headings:
 - i. Introduction
 - ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion
 - vii. Conclusion
 - viii. Summary
 - ix. References
 - x. Tables
 - xi. Annexure
5. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other Checklists. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

6. Four copies of dissertation thus prepared shall be submitted to the University, six months before final examination on or before the dates notified by the University.
7. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
8. **Guide:** The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work shall be as per Medical Council of India Minimum Qualifications for Teachers in Medical Institutions regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining postgraduate degree, shall be recognised as postgraduate teachers.
A **Co-guide** may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/training by the University / Medical Council of India. The co-guide shall be a recognised postgraduate teacher.
9. **Change of guide:** In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.
10. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Monitoring of teaching and learning activities

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) **Personal Attitudes.** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others

- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) ***Clinical skills***

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct

observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

- (iv) **Teaching skills** : Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)
- (v) **Dissertation in the Department** : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)
- (vi) **Work diary / Log Book** - Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.
- (vii) **Periodic tests**: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.
- (viii) **Records**: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV, Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of examination:

1. Theory (Written) :

There shall be four question papers, each of three hours duration, carrying 100 marks. Each paper shall consist of two long essay questions each carrying 20 marks and six short essay type of questions each carrying 10 marks. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I : Basic Sciences

- a. Anatomy of the eye & orbit
- b. Ocular physiology
- c. Ophthalmic pathology
- d. Microbiology & Immunology
- e. Biochemistry relevant to ophthalmology
- f. Geometric and ophthalmic optics

Paper II :

Disorders of Refraction
 Concomitant Strabismus and Amblyopia
 Disorders of the Sclera
 Disorders of the Uvea
 Immune ocular disorders
 Disorders of the Cornea
 Disorders of the Conjunctiva

Paper III :

Disorders of the Orbit
 Disorders of the Lids
 Disorders of the Lacrimal system
 Neuroophthalmology
 Paediatric ophthalmology

Paper IV :

Glaucoma

Systemic ophthalmology

Disorders of the Retina

Disorders of the Lens

Community ophthalmology

Ocular Pharmacology

Note: The distribution of chapters / topics shown against the papers are suggestive only.

2. Clinical Examination : 200 marks

1. Long case :

- a. Duration: 45 minutes – 1 hour
- b. Marks : 50 marks
- c. Type of case:
 - i. Neuro ophthalmology
 - ii. Proptosis
 - iii. Sclerokeratouveitis
 - iv. Uveitis with complications
 - v. Lens induced complications
 - vi. Glaucoma

2. Short cases:

- a. Two short cases of 25 marks each.
- b. Duration: 10 minutes – 15 minutes

3. Fundus cases:

- a. Two fundus cases
- b. Duration: 10 minutes – 15 minutes each
- c. Marks: 25 marks each
- d. Type of cases:
 - i. Rhegmatogenous retinal detachment
 - ii. Diabetic retinopathy, background & proliferative
 - iii. Vasculitis
 - iv. Tractional RD
 - v. Hypertensive retinopathy and combinations of the same with DR
 - vi. Mass lesions
 - vii. High myopia with degeneration
 - viii. Coloboma choroids, simple or with detachment
 - ix. Posterior uveitis, retinitis etc.
 - x. Pigmentary Retinopathy

4. Refraction:

- a. Two refraction cases of 25 marks each.

3. **Viva voce:** 100 marks

a) Students will be examined by all the examiners together about students comprehension of the components of course contents, analytical approach and interpretation of data. This section will carry 80 marks. The examination will include the following:

- i. Community ophthalmology
- ii. Conjunctiva, Cornea, Lens
- iii. Uvea and Glaucoma
- iv. Neuro-ophthalmology & Systemic disorders
- v. Orbit & oculoplastics
- vi. Retina etc.
- vii. Surgical instruments
- viii. Pathology gross specimens
- ix. Pathology slides
- x. Microbiology slides
- xi. Radiology
- xii. Perimetry
- xiii. Miscellaneous

b) Pedagogy Exercise: (20 Marks)

A topic be given to each candidate before the clinical examination. Each will make a presentation on the topic for 8 to 10 minutes.

c) During the viva-voce discussion on dissertation may be held. No marks are assigned as it would have been evaluated separately.

4. **Maximum marks**

Theory	Practical	Viva	Grand Total
400	200	100	700

Recommended Books and Journals:

Recommended books:

1. Duane's System of Ophthalmology
2. Jakobiec Series
3. Peyman's Series
4. Pathology gross specimens Duke-Elder's System of Ophthalmology
5. American Academy Series
6. Podos & Yanoff Series

7. Jack Kanski: Clinical Ophthalmology
8. Cornea :
 - a. Smolin & Thoft
 - b. Grayson
 - c. Kaufman & Leibowitz
9. Glaucoma
 - a. Bruce Shields Text Book of Glaucoma
 - b. Krupin & Shields Series on Glaucoma
 - c. Becker & Schaeffer's Text Book of Glaucoma
 - d. Anderson's Computerised Perimetry
 - e. Harrington's Text Book of Perimetry
 - f. Leiberman and Drake : Computerised perimetry
10. Retinal disease:
 - a. Stephen Ryan's Retina
 - b. Ron Michel: Retinal Detachment
 - c. Steve Charles: Basic Vitrectomy
11. Ultra Sound:
 - a. Sandra Byrne & Ronald Green: Ophthalmic Ultrasound
12. Uvea:
 - a. Nussenblatt & Palestine
 - b. Smith & Nozik
13. Neuroophthalmology:
 - a. Walsh & Hoyt
14. Orbital diseases:
 - a. Rootman's diseases of the orbit
 - b. Jakobiec & Snow – Diseases of the orbit
15. Tumours:
 - a. Jerry Shields – Diagnosis and management of orbital tumours
 - b. Jerry Shields – Diagnosis and management of ocular tumours
16. Strabismus:
 - a. Gunter von Noorden
 - b. Mein & Trimble
17. Ophthalmic Pathology:
 - a. Yanoff & Fine

b. Zimmerman

18. Pharmacology:

a. Havener

19. Anatomy:

a. Wolff

b. Snell's

20. Physiology:

a. Adler's Physiology of the Eye

21. Biochemistry:

a. Standard text books

22. Immunology:

a. Ocular immunology

23. Paediatric ophthalmology

a. Kenneth Wright

24. Refraction:

a. Duke Elder's practice of refraction

b. Elkington & Frank

Diploma in Ophthalmology (D.O.)

Goal: The candidate shall be able to practice ophthalmology competently and safely in the community that he/she serves.

Objectives of the course: At the completion of the course, the candidate shall be able to:

- a. offer to the community, the current quality of 'standard of care' in ophthalmic diagnosis as well as therapeutics, medical or surgical, in most of the common and easily managed situations at the District or Secondary level of health service.
- b. periodically self assess his or her performance and keep abreast with ongoing advances in the field and apply the same in his /her practice.
- c. be aware of his or her own limitations to the application of the specialty in situations which warrant referral to more qualified centers or individuals.
- d. apply research and epidemiological methods during his / her practice. The candidate shall be able to present or publish work done by him/her.
- e. contribute as an individual/or in a group or institution towards the fulfillment of national objectives with regard to prevention of blindness.
- f. effectively communicate with patients or relatives so as to educate them sufficiently and give them the full benefit of informed consent to treatment and ensure compliance.
- g. effectively communicate with colleagues.

Essential theoretical knowledge :

These are only broad guidelines and are illustrative, there may be overlap between sections.

a. The Basic Sciences :

- i. Orbital and Ocular anatomy
 - a. Gross anatomy
 - b. Histology
- ii. Ocular Physiology
- iii. Pathology
 - a. General pathology
 - b. Ocular pathology : Gross pathology, Histopathology.

- iv. Biochemistry: General biochemistry, Biochemistry applicable to ocular function.
- v. Microbiology
 - a. General Microbiology
 - b. Specific microbiology applicable to the eye
 - c. Immunology with particular reference to ocular immunology
- vi. Geometric and ophthalmic optics
 - a. Basic physical optics
 - b. Ophthalmic optics
 - c. Applied optics including optical devices
- b. Clinical Ophthalmology
 - 1. Disorders of Refraction
 - 2. Disorders of the Lids
 - 3. Disorders of the Lacrimal System
 - 4. Disorders of the Conjunctiva
 - 5. Disorders of the Sclera
 - 6. Disorders of the Cornea
 - 7. Disorders of the Uveal Tract
 - 8. Disorders of the Lens
 - 9. Disorders of the Retina
 - 10. Disorders of the Optic Nerve & Visual Pathway
 - 11. Disorders of the Orbit
 - 12. Glaucoma
 - 13. Neuro ophthalmology
 - 14. Paediatric ophthalmology
 - 15. Systemic ophthalmology (Ocular involvement in systemic disease)
 - 16. Immune ocular disorders
 - 17. Strabismus & Amblyopia

Essential diagnostic skills - instrumentation

- Tonometry
 - i. Applanation
 - ii. Indentation (commonly Schiotz)
- Assessment of epiphora
 - i. Jone's dye test
 - ii. Syringing – performance & interpretation
- Dry eye evaluation
 - i. Schirmer test
 - ii. Rose Bengal staining

- iii. Tear film breakup time
 - iv. Tear meniscus evaluation
- Corneal ulceration
 - i. Taking a corneal scraping
 - ii. Inoculation into media
 - iii. Evaluation of Gram's stain
 - iv. Evaluation of KOH preparation
- Direct ophthalmoscopy
 - i. Distant direct
 - ii. Media assessment
 - iii. Use of filters provided
- Indirect ophthalmoscopy
 - i. Scleral depression
 - ii. Fundus drawing capability
 - iii. Use of filters provided
- Slit Lamp Examination
 - i. Diffuse examination
 - ii. Focal examination
 - iii. Retroillumination – direct & indirect
 - iv. Sclerotic scatter
 - v. Specular reflection
 - vi. Staining modalities and interpretation
- Slit Lamp Accessories:
 - i. Applanation Tonometry
 - 1. Goldman's applanation
 - ii. Gonioscopy
 - 1. Single mirror gonioscope
 - 2. Grading of the angle
 - 3. Testing for occludability
 - 4. Indentation gonioscopy
 - iii. 3-mirror examination of the fundus
 - iv. 78-D / 90-D / 60-D examination
- Colour vision evaluation
 - i. Ishihara pseudoisochromatic plates
- Use of Amsler's charting

- i. Instructing in the use of and interpreting the chart.
- Keratometry
 - i. Performance & interpretation of keratometry
 - ii. Diagnosis of situations such as keratoconus
 - iii. Keratoscopy
- Fundus photography & fundus fluorescein angiography (FFA, FAG)
 - i. Performance of and interpretation of FFA
 - ii. Performance of indirect fluorescein angioscopy
- Refraction
 - i. Retinoscopy
 - ii. Streak Retinoscopy
 - iii. Use of trial set
 - iv. Use of Jackson's cross-cylinder
 - v. Subjective and objective refraction
- Diagnosis & assessment of Squint
 - i. Ocular position and motility examination
 - ii. Versions, ductions, and vergences
 - iii. Convergence facility estimation
 - iv. Cover / Uncover / Alternate cover test
 - v. Use of prism bars or free prisms in assessment of squint
 - vi. Use of Bagolini's striated glasses / red filters / Maddox rod
 - vii. Use of Worth's four dot test
 - viii. Use of minor amblyoscope
 - ix. Use & interpretation of the Hess chart / Lees' screen
 - x. Performance & interpretation of diplopia charting
 - xi. Diagnosis of amblyopia
- Exophthalmometry
 - i. Measurement of proptosis or exophthalmos
- Use and evaluation of ophthalmic ultrasound
 - i. A- scan ultrasound with biometry
- Interpretation of perimetry
 - i. Static computerized perimetry
 - 1. Interpretation of commonly managed problems
- Radiology
 - i. Interpretation of plain skull films
 - 1. PA-20 (Caldwell's view)

2. PNS (Water's view)
3. Lateral
4. Submentovertical
5. Optic canal views
6. Localisation of intra ocular and intra orbital FBs

ii. Interpretations of contrast studies

iii. Interpretation of CT – Scans

1. Orbital CT interpretation

Essential surgical skills

Procedure	Nature of Activity and Number			
	O	A	PA	PI
1. Operating theatre				
a. Anaesthesia :				
i. Retrobulbar anaesthesia	-	-	-	15
ii. Peribulbar anaesthesia	-	-	-	15
iii. Facial blocks	✓	-	-	-
• O'Brein	-	-	-	15
• Atkinson	-	-	-	15
• van Lint & modifications	-	-	-	2
iv. Frontal blocks	-	-	-	1
v. Infra orbital blocks	-	-	-	1
vi. Blocks for sac surgery	-	-	-	3
b. Magnification :				
i. Operating microscope : Familiarity with use is essential	-	-	-	✓
c. Lid surgery:				
i. Tarsorrhaphy	-	-	-	5
ii. Ectropion and entropion procedures	-	-	-	1
iii. Lid repair following trauma	-	-	1	-
iv. Epilation,	-	-	-	5
d. Destructive procedures:				
i. Evisceration with or without implant	-	-	-	1

Procédure	Nature of Activity and Number			
	O	A	PA	PI
ii. Enucleation with or without implant	-	-	-	3
e. Sac surgery				
i. Dacryocystectomy	-	-	-	2
ii. Dacryocystorhinostomy	-	-	-	1
iii. Probing for congenital obstruction of nasolacrimal duct	-	-	1	-
f. Extraocular muscle surgery				
i. Recession and resection procedures on the horizontal recti	-	-	1	-
g. Cataract surgery				
i. Standard ECCE with or without IOL implantation.	-	-	-	1
ii. Small incision ECCE with or without IOL implantation	✓	-	-	-
iii. Secondary AC or PC IOL implantation	✓	-	-	-
iv. Vectis extraction	-	-	1	-
h. Orbit surgery				
i. Incision and drainage via anterior orbitotomy for abscess	-	1	-	-
i. Vitrectomy				
i. Intra vitreal and intra cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitis management.	-	-	1	-
ii. Needs to know the basics of open sky vitrectomy (anterior segment) as management of cataract surgery complication	-	-	-	1
j. Keratoplasty				
i. Assisting penetrating keratoplasty (therapeutic, optical)	-	-	1	-

Procedure	Nature of Activity and Number			
	O	A	PA	PI
k. Glaucoma surgery				
i. Trabeculectomy	-	-	-	1
ii. Pharmacological modifications of trabeculectomy				
iii. Cyclocryotherapy	-	-	-	1
l. Surface ocular procedures				
i. Pterygium excision with modifications	-	-	-	2
ii. Conjunctival grafting	-	-	1	-
m. Pterygium excision	-	-	-	2
n. Tarsorrhaphy	-	-	-	5
o. Retrobulbar, parabulbar anaesthesia	-	-	-	15
2. Outpatient :				
a. Manual diagnostic procedures such as syringing, corneal scraping, conjunctival swab collection, conjunctival scraping etc.	-	-	-	5
b. Conjunctival and corneal foreign body removal on the slit lamp	-	-	-	5
c. Chalazion incision and curettage	-	-	-	5
d. Biopsy of small lid and tumours	-	-	1	-
e. Suture removal skin, conjunctival, corneal, and corneoscleral	-	-	-	3
f. Subconjunctival injection	-	-	-	8
g. Posterior Sub- Tenon's injections	-	-	-	2
h. Artificial eye fitting	-	-	-	2

Essential Research Skills

1. Basic statistical knowledge
 - b. Ability to undertake clinical & basic research
 - c. Descriptive and Inferential statistics
 - d. Ability to publish results of one's work
2. Ability to constructively criticize publications in the field and without
3. This could be achieved during the course by attending regularly Journal Clubs etc. where selected articles could be taken and evaluated for content quality and presentation.

Other skills required:

1. Contact lenses
 - a. Assessment
 - b. RGP fitting
 - c. Soft lens fitting
 - d. Troubleshooting
2. Subjective correction of refraction
 - a. Techniques of subjective correction
 - b. Knowledge of basic optical devices available and relative advantages and disadvantages of each.
3. Low vision aids
 - a. The basics of fitting with knowledge of availability & cost
4. Community ophthalmology
 - a. Ability to organize institutional screening
 - b. Ability to organize peripheral eye screening camps
 - c. Knowledge and ability to execute guidelines of National Program for Prevention of Blindness
5. Presentation
 - a. Ability to present one's work effectively at various scientific for a particularly free papers in scientific conferences within allotted framework of time
6. Organisation
 - a. Ability to organize meetings, seminars and symposia
 - b. Ability to get along with colleagues and work as a team with the other members of the department.
 - c. Ability to interact with and work as a team with other disciplines that may exist in the same hospital.
7. Communication skills
 - a. With patients
 - b. With colleagues
8. Record keeping
 - a. The ability to maintain records as scientifically as possible
 - b. Knowledge of computer software is helpful
9. Teaching
 - a. The ability to pass on skills acquired to one's juniors, theoretical, procedural and surgical

Academic Activities

Year – wise structured training schedule

First year :

1. Theoretical knowledge

- a. Basic sciences should be addressed during this period
- b. It is useful to have an internal examination of the basic sciences at the end of the first year, which will decide appearance at the final examination.
- c. Clinical ophthalmology.

2. Clinical examination and diagnostics

- a. The basics of history taking, order and correct methods of examination and recording have to be learnt during this time.
- b. Clinical and surgical decision making is encouraged under supervision.

3. Diagnostics

- a. All procedures in bold should as far as possible be done and the student should be fairly conversant with most of the techniques marked in bold.

4. Surgery

- a. Extra ocular surgery including
 - i. Destructive procedures must have been done independently with or without assistance
 - ii. Local Anaesthesia (retrobulbar and peribulbar blocks)
 - iii. Subconjunctival injections
 - iv. Assisting for squint surgery
 - v. Assisting for lid surgery. Tarsorrhaphy should be performed independently as also the simpler oculoplastic procedures.
 - vi. Chalazion and Pterygium surgery.
 - vii. Lid and corneal foreign body removal, suture removal on the slit lamp etc.
 - viii. At the end of the first year, the student should have participated as assistant in most of the intra ocular procedures as an assistant.
 - ix. Cataract surgery :
 1. Cataract surgery should be approached in stages, emphasis to be given on microscopic surgery.

2. At the end of the first year, the student should be able to do standard extracapsular cataract extraction at least under guidance.

Second year :

Theoretical Knowledge :

Here stress will be laid on clinical ophthalmology

Clinical examination and diagnostics

The student is encouraged to take diagnostic investigational and therapeutic decisions on his / own. He / she should be able to manage most of the common problems that arise without guidance. However, the degree of freedom allowed in decision making is left to the confidence of the teacher in the student's abilities. It is to be encouraged. May require guidance for more complex cases.

Diagnostics

The student should be conversant and at ease with all the diagnostic procedures outlined in the section on 'Essential diagnostic skills-instrumentation'.

Surgical skills

At the end of the second year, the student should be capable of operating, without assistance, but under supervision, all varieties of cataract except congenital cataract. He / she should also know the management of cataract induced complications and cataract surgical complications (management of vitreous loss).

He/she should have performed the basic antiglaucoma procedures such as trabeculectomy either with assistance or under supervision

Extra ocular surgery such as squint surgery could be performed with assistance.

In addition, lacrimal sac surgery such as dacryocystectomy and dacryocystorhinostomy should be possible with assistance or under supervision.

Conferences and workshops

The candidate should have attended one or two regional workshops and one national conference if possible. Presentation of a free paper at these venues is to be encouraged.

Clinical Case discussions

Bedside discussion on the rounds, outpatient teaching in addition to these, clinical case discussions should form part of a department's schedule.

Case discussions on the patient's records written by the student is to be encouraged as it helps exercise the student's diagnostic and decision making skills. It also helps the consultant in critical evaluation of the student's progress academically.

Case presentation at other hospitals and multidisciplinary forums may be encouraged.

Seminars

Seminars should be conducted at least once weekly. The duration should be 1–1.5 hours. The topics selected should be repeated once in 2 years so as to cover as wide a range of topics as possible.

Seminars could be individual presentations or a continuum (large topic) with many candidates participating.

Each candidate shall present at least three seminar a year and a total of six seminars in two years

Journal Clubs

This also should be a once a week or once in two week exercise. The topics selected should be current. It could be done topic wise or journal wise. Ideally, indexed journals are recommended.

Each candidate shall present journals allotted at least three times in a year and a total of six such presentations be made in two years

CPC

CPCs are extremely useful clinicopathological exercises and two or more should be done per year.

Lectures

Lectures to candidates should be in the form of instructional courses at the beginning of the academic term. These would include topics such as dark room techniques, fundus fluorescein angiography, evaluation of perimetry, squint evaluation and management, slit lamp examination with accessories such as gonioscopy etc.

Lectures could also be arranged round the year on subspecialty topics.

During the course, the candidates should have one lecture / one seminar on National programs (eg. National program for control of blindness, Trachoma program etc.), International assistance schemes for execution of national program (DAN-PCB, Lion's International, Christoffel-Blunden Mission etc). These would be addressed to in detail, including current status etc.. In addition, it would be useful to include a few details of other non-ophthalmic programs being undertaken in the country.

Research Activities

Every candidate may be allotted a departmental project either clinical or basic research, ongoing or afresh. A candidate should learn to be conversant with journal browsing, medline search etc. to help in project and clinical and research work.

Rotation and Posting in other Departments:

In institutions where subspecialties are not being usually performed, (eg. VR surgery, orbit surgery etc.), students could be deputed for a month or so in institutions in which these specialities are highly developed.

For an Diploma student, optional rotation postings to allied departments would include

Plastic Surgery

Neurology / Neurosurgery

Intensive Care

ENT

The total duration of posting should not exceed 2 months.

Orientation programme

All postgraduates from all specialties should have an introductory program in the institution where they are informed about candidate responsibilities, working systems, library usage, lab protocols etc.

Specific orientation regarding the departmental working could be made as an introductory talk in the department concerned.

Monitoring of teaching and learning activities

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) **Personal Attitudes.** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others

- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) ***Clinical skills***

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct

observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

- (iv) *Work diary / Log Book* - Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.
- (v) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.
- (vi) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV, Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of examination

a. Theory (Written)

There shall be four question papers, each of three hours duration, carrying 100 marks. Each paper shall consist of two long essay questions each carrying 20 marks

and six short essay type of questions each carrying 10 marks. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I :

1. Basic Sciences :

Anatomy of the eye & orbit

Ocular physiology

Ophthalmic pathology

Microbiology & Immunology

Biochemistry relevant to ophthalmology

Geometric and ophthalmic optics

2. Disorders of Refraction

3. Concomitant Strabismus and Amblyopia

4. Paediatric ophthalmology

5. Disorders of the Lens

Paper II :

1. Disorders of the Sclera

2. Disorders of the Uvea

3. Immune ocular disorders

4. Disorders of the Cornea

5. Disorders of the Conjunctiva

Paper III :

1. Disorders of the Orbit

2. Disorders of the Lids

3. Disorders of the Lacrimal system

4. Neuroophthalmology

5. Glaucoma

6. Systemic ophthalmology

7. Disorders of the Retina

8. Community ophthalmology

9. Ocular Pharmacology

Note: The distribution of chapters / topics shown against the papers are suggestive only.

b. Clinical Examination: Total marks = 150

1. One long case

a. Marks: 50

b. Type of case:

i. Neuro ophthalmology

- ii. Proptosis
- iii. Sclerokeratouveitis
- iv. Uveitis with complications
- v. Lens induced complications
- vi. Glaucoma
- vii. Other

2. Two short cases: Marks: 25 + 25 = 50

3. One fundus case: Marks: 25

Type of cases:

- i. Rhegmatogenous retinal detachment
- ii. Diabetic retinopathy, background & proliferative
- iii. Vasculitis
- iv. Tractional RD
- v. Hypertensive retinopathy and combinations of the same with DR
- vi. Mass lesions
- vii. High myopia with degeneration
- viii. Coloboma choroids, simple or with detachment
- ix. Posterior uveitis, retinitis etc.
- x. Pigmentary Retinopathy

4. One refraction case: a. Duration: 10 minutes b. Marks: 25
c. The candidate should perform retinoscopy, on each eye.

c. Viva - voce: Marks: 50

Viva- voce shall include questions on the following :

- a. Surgical instruments displayed
- b. Pathology slides and Pathology gross specimens
- c. Microbiology slides:
- d. Radiology
- e. Perimetry
- f. Neuro-ophthalmology & Systemic disorders
- g. Community ophthalmology
- h. Uvea and Glaucoma
- i. Conjunctiva, Cornea, Lens, Retina
- j. Orbit & oculoplastics
- k. Miscellaneous

iv.	Maximum marks for DO	Theory 300	Practical 150	Viva 50	Grand Total 500
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Recommended Books and Journals:

Recommended books:

1. Duane's System of Ophthalmology
2. Jakobiec Series
3. Peyman's Series
4. Duke-Elder's System of Ophthalmology
5. American Academy Series
6. Podos & Yanoff Series
7. Jack Kanski: Clinical Ophthalmology
8. Cornea :
 - a. Smolin & Thoft
 - b. Grayson
 - c. Kaufman & Leibowitz
9. Glaucoma
 - a. Bruce Shields Text Book of Glaucoma
 - b. Krupin & Shields Series on Glaucoma
 - c. Becker & Schaeffer's Text Book of Glaucoma
 - d. Anderson's Computerised Perimetry
 - e. Harrington's Text Book of Perimetry
 - f. Leiberman and Drake : Computerised perimetry
10. Retinal disease:
 - a. Stephen Ryan's Retina
 - b. Ron Michel: Retinal Detachment
 - c. Steve Charles: Basic Vitrectomy
11. Ultra Sound:
 - a. Sandra Byrne & Ronald Green: Ophthalmic Ultrasound
12. Uvea:
 - a. Nussenblatt & Palestine
 - b. Smith & Nozik
13. Neuroophthalmology:
 - a. Walsh & Hoyt
14. Orbital diseases:
 - a. Rootman's diseases of the orbit
 - b. Jakobiec & Snow – Diseases of the orbit
15. Tumours:
 - a. Jerry Shields – Diagnosis and management of orbital tumours
 - b. Jerry Shields – Diagnosis and management of ocular tumours
16. Strabismus:
 - a. Gunter von Noorden
 - b. Mein & Trimble
17. Ophthalmic Pathology:
 - a. Yanoff & Fine

b. Zimmerman

18. Pharmacology:

a. Havener

19. Anatomy:

a. Wolff

b. Snell's

20. Physiology:

a. Adler's Physiology of the Eye

21. Biochemistry:

a. Standard text books

22. Immunology:

a. Ocular immunology

23. Paediatric ophthalmology

a. Kenneth Wright

24. Refraction:

a. Duke Elder's practice of refraction

b. Elkington & Frank

Chapter III

Post Graduate Courses in Orthopedics

M.S. Orthopedics

Objectives:

At the end of the course, the candidate should be:

1. aware of the current concepts in quality care in orthopedics and musculo-skeletal trauma and also of diagnosis, therapeutic, medical or surgical management of orthopedic problems,
2. able to offer initial primary management of acute orthopedic and trauma emergencies.
3. aware of the limitations and refer readily to major centers for more qualified care of cases which warrant such referral.
4. aware of research methodology and be able to conduct research and publish the work done.
5. able to effectively communicate with patients, their family members, people and professional colleagues.
6. able to exercise empathy and a caring attitude and maintain high ethical standards.
7. continue to evince keen interest in continuing education irrespective of whether he/she is in a teaching institution or in clinical practice .

Course contents:

Essential theoretical knowledge

I. BASIC SCIENCES

Anatomy

- i) Musculo skeletal anatomy – Anatomy of the shoulder girdle, pelvic girdle, upper & lower limbs anatomy of the spine
- ii) Embryology and development of musculo skeletal system.
- iii) Histology.

Physiology

- i) Physiology of musculo skeletal system
- ii) Metabolism of bone, hormonal influence on musculo skeletal system & other related orthopaedic physiology

Pathology

- i) General pathology.
- ii) Tumour pathology in musculo skeletal system
- iii) Other orthopaedic pathology.

Biochemistry

- i) General Biochemistry.
- ii) Biochemical aspects related to orthopaedic diseases

II. CLINICAL ORTHOPAEDICS**General Orthopaedics**

- i) General principal of healing of injury & musculoskeletal trauma.
- ii) Systemic management of the injured & body response to trauma.
- iii) Head injury & fascio maxillary injury.
- iv) General principal of management of Neurovascular injury.
- v) Management of poly trauma.
- vi) Consequences of musculoskeletal trauma & rehabilitation of the injured.
- vii) General principal of management musculoskeletal trauma- surgical and conservative.
- viii) Compound injuries – management and stabilisation procedures in orthopaedics.
- ix) General principal of management musculo skeletal trauma – in children.

III. ORTHOPAEDIC TRAUMATOLOGY

- i) Musculoskeletal trauma in shoulder girdle and upper limb.
- ii) Musculoskeletal trauma in pelvic girdle and lower limb.
- iii) Injuries of the spine and management of paraplegia.
- iv) Pathological fractures and management.

IV. DISEASES IN ORTHOPAEDICS

- i) Congenital malformations.
- ii) Metabolic, developmental & hormonal disorders in musculoskeletal system.
- iii) Epiphyseal and neuromuscular affections in children.
- iv) Infective Diseases in musculo-skeletal system including polio & Leprosy.
- v) Arthritis and Rheumatic disease.
- vi) Tumours of musculoskeletal system.
- vii) Amputations.
- viii) Prosthetics and orthotics.
- ix) Physical medicine.

V. SPORTS MEDICINE INCLUDING ARTHROSCOPY.

VI. ESSENTIAL DIAGNOSTIC SKILLS – INSTRUMENTATION

Radiology

- a) General muskuloskelatal radiology – plain X-ray.
- b) MRI.
- c) CT Scan.
- d) Scintigraphy & Bone scan.
- e) Stress radiography.
- f) Ultrasonography.

Interventional Radiography

- a) Sinogram.
- b) Myelography
- c) Epidurogram
- d) CT Guided biopsy.
- e) Arthrogram

Arthroscopy

Biopsy

- a) Trocar
- b) FNAC

VII. SURGICAL SKILLS

Anaesthesia

Regional anesthesia

- a) Wrist block & Digital block.
- b) Femoral block.
- c) Ankle block.
- d) Brachial block & inter scalene block.
- e) Spinal anaesthesia.
- f) IVRA.

VIII. SURGICAL PROCEDURES

Pelvic girdle & lower limb

- a) Fracture fixation.
- b) Osteotomies and Arthrodesis in lower limb.
- c) HRA in Hip joint
- d) Soft tissue surgeries.
- e) Foot and ankle surgery.
- f) Management of nonunion of fractures with illizarov.

- g) Deformity correction with illizarov.
- h) Ligamentious reconstruction of knee joint.
- i) Plastic reconstruction and other reconstructive procedures in muskuloskeletal trauma.
- j) Arthroscopic surgeries.
- k) Total hip arthroplasty.
- l) Total Knee arthroplasty.
- m) Total Ankle arthroplasty
- n) Stabilisation of pelvic fracture by external fixator.
- o) Acetabular fracture fixation and pelvic osteotomies

IX. SHOULDER GIRDLE & UPPER LIMB

- a) Fracture fixation, Osteotomies and Arthrodesis in upper limb.
- b) Reconstructive surgeries in shoulder joint.
- c) Soft tissue surgeries
- d) Elbow and Hand surgery.
- e) Management of nonunion of fractures with illizarov
- f) Deformity correction with illizarov
- g) Plastic reconstruction and other reconstructive procedures in muskuloskeletal tumours
- h) Arthroscopic surgeries
- i) Total shoulder arthroplasty.
- j) Total Elbow arthroplasty.

X. SPINE SURGERIES

- a) Posterior spinal fusion.
- b) Disc surgery & decompressive procedures in spine.
- c) Instrumentation in spine.
- d) Endoscopic surgery in spine.
- f) Deformity correction in spine.
- g) Surgical procedures in TB Spine.

XI. SURGICAL PROCEDURES – EMERGENCY

- a) Primary wound debridement & External fixater application.
- b) Emergency amputations.
- c) Primary internal fixation for compound fractures.

2.1 Graded responsibility in care of patients and operative work

I YEAR

Trauma care

Closed reductions of fractures, Plaster application,

Debridement of open fractures, External fixations

Internal fixations of minor fractures with K wire

Non-traumatic conditions:

Manipulative correction of congenital problems like CTEV

Biopsies

Excision of benign lesions

Tendon lengthening

II year

Trauma

Tension band wiring of fracture patella, fracture olecranon, etc

DCP of forearm bones, tibia, etc

DHS

Non-traumatic conditions:

Carpal tunnel release

Bone grafting

Soft tissue release under supervision

III YEAR

Trauma

Hemi replacement arthroplasty of femur

Dynamic condylar screw fixation

Interlocking nailing of long bone fractures

Non-traumatic conditions

Osteotomies

Soft tissue release

Tendon transfers

Basic arthroscopy (diagnostic)

Teaching Learning Activities

Participation in departmental activities

1. Clinical rounds – bedside clinical discussion, treatment modalities, record maintenance, discussion of alternate methods of management, PG notes, etc
2. Journal review meeting
Review of recent journals and presentation of the same in the departmental meetings. Should include indexed international and national journals. At least four presentations should be made by each candidate in each year of the course.
3. Seminars – on Musculo skeletal trauma and Diseases in orthopaedics. Arthroplasty, spinal instrumentation and Recent advances in orthopedics. At least 4 seminars per year by each MS candidate.

4. Should attend CPCs
5. Interdepartmental meetings – Ortho-radiology and Ortho-pathology meetings should be attended by PGs
6. Preparation and presentation of dissertation work – should present to the dept the review of literature in the first year and whole work by the second year to the dept.

Rotation and posting in other depts

Basic sciences

Anatomy – one hour every week in anatomy dissection hall for 6 months in the first year

Applied subjects -posting in second year

Casualty / emergency medicine for 2 weeks

Anaesthesia for 2 weeks

Radiology including CT/MRI for one month

Neurosurgery for one month

Plastic surgery for one month

Surgical ICU/ general surgical unit for one month

Allied subjects

Posting in artificial limb centre / physical medicine and rehabilitation for one month

Training in teaching skills

Bedside clinic for undergraduates for 20 hours

Bedside clinic for first year PG by THIRD Year PG for 10 hours.

Should have attended at least one National CME during the course

Should have presented at least one paper in any of the Orthopedic conferences during the course

Dissertation

Every candidate pursuing MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work

within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

The dissertation should be written under the following headings:

- i. Introduction
- ii. Aims or Objectives of study
- iii. Review of Literature
- iv. Material and Methods
- v. Results
- vi. Discussion
- vii. Conclusion
- viii. Summary
- ix. References
- x. Tables
- xi. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.

The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.

Change of guide: In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.

For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

1. Methods – theory examinations
Clinical examinations
2. Frequency – theory exams once 6 months
Clinical examinations once a year
3. Log book records

Orientation programmes

- a. Use of library – use of periodicals, Use of electronic library
Use of Internet,
- b. Laboratory procedures - FNAC, bone marrow aspiration
- c. National programmes – attending postgraduate teaching programs
advised
- d. Regulations – medical ethics.
- e. Research Methodology

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, in Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-Pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Surgical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) *Clinical Operative skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Operative skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills :* Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) *Dissertation in the Department* : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book*- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of examination

A. Theory

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I - Basic and clinical sciences as applied to Orthopedics

Paper II - Musculo-skeletal Trauma

Paper III - General Orthopedics, Joint Disorders and Spine

Paper IV - Regional Orthopedics.

B. Clinical 200 Marks

There shall be one long case and three short cases to be examined and presented by each candidate. Marks shall be 200.

C. Viva Voce: 100 Marks

1) Viva-Voce Examination: (80 Marks)

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, etc., for interpretation. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 Marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes

D.

Maximum marks for M.S. in Orthopedics	Theory	Practical	Viva	Grand Total
	400	200	100	700

Recommended books and Journals

1. Campbell's Operative Orthopaedics 8th edition, S. Terry Canale, editorial assistance by Kay Daughtery published by MOSBY, St. Louis, USA, 1998, 400 U K \$
2. Fractures in adults & Children 4th edition Charles A. Rockwood Jr., David P. Green, Robert E. Bucholz, and James D Heckman, 1996, Lippincott-Raven Publishers, USA
3. Orthopaedic, 5th edition, edited by Samuel² Turek, published by Jay Pee Brothers New Delhi, 1993
4. Mercer's Orthopaedic surgery 9th edition Robert B Duthie & George Bentley, Published in Great Britain in 1996 by ARNOLD
5. J.N.Wilson Watson – Jones Fracture and Joint injuries 6th edition, published by B.I. Churchil. Livingstone pvt. Ltd. NewDelhi – 1992, price: Rs 1400-00
6. Knee Surgery edited by Paul M. Aichroth & W. Dilworth Cannon, Jr. Published in USA by Raven Press in 1992, \$3127.
7. Total Hip Joint Replacement edited by Eftekhari NS
8. Total Knee Arthroplasty edited by James A. Rand published by Raven press; New York 1993
9. Tureks text book of orthopedics
10. Rockwood and Green - text book of fractures and joint injuries
11. Browner – fractures and dislocations
12. Gustilo – fractures and joint injuries
13. Sharrard – paediatric orthopedics
14. Tachdian – paediatric orthopedics
15. Enneking – bone tumors
16. Campanacci – bone tumors

Journals

1. Journal of bone and Joint Surgery
2. American journal of Orthopaedics.
3. Clinical Orthopaedics and Related Research.
4. Orthopaedic clinics of North America.
5. TRAUMA.
6. Arthroscopy.
7. Indian Journal of Orthopaedics.
8. Journal of Arthroplasty.
9. Journal of Spine Surgery.
10. Acta orthopædica Scandinavia
11. J. paed. Ortho

Diploma in Orthopedics (D Ortho)

Objectives:

At the end of the course, the candidate should be:

1. aware of the current concepts in quality care in orthopedics and musculo-skeletal trauma and also of diagnosis, therapeutic, medical or surgical management of orthopedic problems,
2. able to offer initial primary management of acute orthopedic and trauma emergencies.
3. aware of the limitations and refer readily to major centers for more qualified care of cases which warrant such referral.
4. able to critically review published scientific work .
5. able to effectively communicate with patients, their family members, people and professional colleagues.
6. able to exercise empathy and a caring attitude and maintain high ethical standards.
7. evince keen interest in continuing education and life long learning.

Course contents

Essential theoretical knowledge

I. Basic Sciences

Anatomy

- i) Musculo skeletal anatomy – Anatomy of the shoulder girdle, pelvic girdle, upper & lower limbs anatomy of the spine
- ii) Embryology and development of musculo skeletal system.
- iii) Histology.

Physiology

- i) Physiology of musculo skeletal system
- ii) Metabolism of bone, hormonal influence on musculo skeletal system & other related orthopaedic physiology

Pathology

- i) General pathology.
- ii) Tumour pathology in musculo skeletal system
- iii) Other orthopaedic pathology.

Biochemistry

- i) General Biochemistry.
- ii) Biochemical aspects related to orthopaedic diseases

II. Clinical Orthopaedics

General Orthopaedics

- i) General principal of healing of injury & musculoskeletal trauma.
- ii) Systemic management of the injured & body response to trauma.
- iii) Head injury & fascio maxillary injury.
- iv) General principal of management of Neurovascular injury.
- v) Management of poly trauma.
- vi) Consequences of musculoskeletal trauma & rehabilitation of the injured.
- vii) General principal of management musculoskeletal trauma- surgical and conservative.
- viii) Compound injuries – management and stabilisation procedures in orthopaedics.
- ix) General principal of management musculo skeletal trauma – in children.

III. Orthopaedic Traumatology

- i) Musculoskeletal trauma in shoulder girdle and upper limb.
- ii) Musculoskeletal trauma in pelvic girdle and lower limb.
- iii) Injuries of the spine and management of paraplegia.
- iv) Pathological fractures and management.

IV. Diseases In Orthopaedics

- i) Congenital malformations.
- ii) Metabolic, developmental & hormonal disorders in musculoskeletal system.
- iii) Epiphyseal and neuromuscular affections in children.
- iv) Infective Diseases in musculo-skeletal system including polio & Leprosy.
- v) Arthritis and Rheumatic disease.
- vi) Tumours of musculoskeletal system.
- vii) Amputations.
- viii) Prosthetics and orthotics.
- ix) Physical medicine.

V. Sports Medicine Including Arthroscopy.

VI. Interventional Radiography

- a) Sinogram.
- b) Myelography
- c) Epidurogram
- d) CT Guided biopsy.

- e) Arthrogram

VII. Knowledge of Surgical Procedures

Pelvic girdle & lower limb

- a) Fracture fixation.
- b) Osteotomies and Arthrodesis in lower limb.
- c) HRA in Hip joint
- d) Soft tissue surgeries.
- e) Foot and ankle surgery.
- f) Management of nonunion of fractures with illizarov.
- g) Deformity correction with illizarov.
- h) Ligamentous reconstruction of knee joint.
- i) Plastic reconstruction and other reconstructive procedures in musculoskeletal trauma.
- j) Arthroscopic surgeries.
- k) Total hip arthroplasty.
- l) Total Knee arthroplasty.
- m) Total Ankle arthroplasty
- n) Stabilisation of pelvic fracture by external fixator.
- o) Acetabular fracture fixation and pelvic osteotomies

VI. Essential Diagnostic Skills – Instrumentation

Radiology

- a) General musculoskeletal radiology – plain X-ray.
- b) MRI.
- c) CT Scan.
- d) Ultrasonography.

Interventional Radiography

- a) Sinogram.
- b) Myelography

Arthroscopy

Biopsy

- a) Trocar
- b) FNAC

VII. Surgical Skills

Anaesthesia

Regional anaesthesia

- a) Wrist block & Digital block.

b) Femoral block.

c) Ankle block.

VIII. Surgical Procedures

Pelvic girdle & lower limb

- a) Fracture fixation.
- b) Osteotomies and Arthrodesis in lower limb.
- c) HRA in Hip joint
- d) Soft tissue surgeries.
- e) Foot and ankle surgery.

IX. Shoulder Girdle & Upper Limb

- a) Fracture fixation, Osteotomies and Arthrodesis in upper limb.
 - b) Reconstructive surgeries in shoulder joint.
 - c) Soft tissue surgeries
 - d) Elbow and Hand surgery.
 - e) *Management of nonunion of fractures with illizarov**
 - f) *Deformity correction with illizarov**
 - g) *Plastic reconstruction and other reconstructive procedures in musculoskeletal tumours**
 - h) *Arthroscopic surgeries**
 - i) *Total shoulder arthroplasty*.*
 - j) *Total Elbow arthroplasty.**
- (*Should know the procedures and observe the procedures)*

X. Spine Surgeries

- a) Posterior spinal fusion.
- b) Disc surgery & decompressive procedures in spine.
- c) *Instrumentation in spine.**
- d) *Endoscopic surgery in spine*.*
- f) *Deformity correction in spine.**
- g) *Surgical procedures in TB Spine.**

*(*Should know the procedures and observe the procedures)*

XI. Surgical Procedures – Emergency

- a) Primary wound debridement & External fixater application.
- b) Emergency amputations.
- c) *Primary internal fixation for compound fractures.**

*(*Should know the procedures and observe the procedures)*

Graded responsibility in care of patients and operative work

I YEAR**Trauma care**

Closed reductions of fractures, Plaster application,
Debridement of open fractures, External fixations
Internal fixations of minor fractures with K wire

Non-traumatic conditions:

Manipulative correction of congenital problems like CTEV
Biopsies
Excision of benign lesions
Tendon lengthening

II year**Trauma**

Tension band wiring of fracture patella, fracture olecranon, etc
DCP of forearm bones, tibia, etc
DHS

Non-traumatic conditions:

Carpal tunnel release
Bone grafting
Soft tissue release under supervision

Teaching Learning Activities**Participation in departmental activities**

1. Clinical rounds – bedside clinical discussion, treatment modalities, record maintenance, discussion of alternate methods of management, PG notes, etc
2. Journal review meeting
Review of recent journals and presentation of the same in the departmental meetings. Should include indexed international and national journals. At least four presentations should be made by each candidate in each year of the course.
3. Seminars – on Musculo skeletal trauma and Diseases in orthopaedics. Arthroplasty, spinal instrumentation and Recent advances in orthopedics. At least 4 seminars per year by each MS candidate.
4. Should attend CPCs
5. Interdepartmental meetings – Ortho-radiology and Ortho-pathology meetings should be attended by PGs
6. Preparation and presentation of dissertation work – should present to the dept the review of literature in the first year and whole work by the second year to the dept.

7. Orientation programmes:

- a. Use of library
Use of electronic library
Use of Internet
- b. Laboratory procedures - FNAC, bone marrow aspiration
- c. National programmes – attending postgraduate teaching programs advised
- d. MCI & RGHUS Regulations
- e. Medical ethics.

8. Should have attended at least one National CME and Orthopedic conference during the course

Rotation and posting in other depts

Basic sciences : Anatomy – one hour every week in anatomy dissection hall for 6 months in the first year

Applied subjects -posting in second year

Casualty / emergency medicine for 2 weeks

Anaesthesia for 2 weeks

Radiology including CT/MRI for one month

Neurosurgery for one month

Plastic surgery for one month

Surgical ICU/ general surgical unit for one month

Allied subjects: Posting in artificial limb centre / physical medicine and rehabilitation for one month

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, and (iii) Clinical and operative skills.

i) **Personal Attitudes.** The essential items are:

- Caring attitudes
- Initiative

- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
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The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

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Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) ***Clinical skills***

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Periodic tests:*

The departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book-* Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records:* Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

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that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

A. Theory

There shall be three question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I: Basic Science as applicable to Orthopedics and Clinical Orthopedics

Paper II: Orthopedic traumatology

Paper III: Orthopedics

B. Clinical 150 Marks

There shall be one long case and two short cases to be examined and presented by each candidate. Marks shall be 150

C. Viva Voce: 50 Marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images etc., for interpretation.

D.

Maximum marks for Diploma in Orthopedics	Theory	Practical	Viva	Grand Total
	300	150	50	500

Recommended books and Journals

1. Campbell's Operative Orthopaedics 8th edition, S. Terry Canale, editorial assistance by Kay Daughtery published by MOSBY, St. Louis, USA, 1998, 400 U K \$
2. Fractures in adults & Children 4th edition Charles A. Rockwood Jr., David P. Green, Robert E. Bucholz, and James D Heckman, 1996, Lippincott-Raven Publishers, USA
3. Orthopaedic, 5th edition, edited by Samuel Turek, published by Jay Pee Brothers New Delhi, 1993
4. Mercer's Orthopaedic surgery 9th edition Robert B Duthie & George Bentley, Published in Great Britain in 1996 by ARNOLD
5. J.N.Wilson Watson – Jones Fracture and Joint injuries 6th edition, published by B.I. Churchil. Livingstone pvt. Ltd. New Delhi – 1992, price: Rs 1400-00
6. Knee Surgery edited by Paul M. Aichroth & W. Dilworth Cannon, Jr. Published in USA by Raven Press in 1992, \$3127.
7. Total Hip Joint Replacement edited by Eftekhari NS
8. Total Knee Arthroplasty edited by James A. Rand published by Raven press; New York 1993
9. Tureks text book of orthopedics
10. Rockwood and Green - text book of fractures and joint injuries
11. Browner – fractures and dislocations
12. Gustilo – fractures and joint injuries
13. Sharrard – paediatric orthopedics.
14. Tachdian – pediatric orthopedics.
15. Enneking – bone tumors.
16. Campanacci – bone tumors.

Journals

1. Journal of bone and Joint Surgery.
2. American journal of Orthopaedics.
3. Clinical Orthopaedics and Related Research.
4. Orthopaedic clinics of North America.
5. TRAUMA.
6. Arthroscopy.
7. Indian Journal of Orthopaedics.
8. Journal of Arthroplasty.
9. Journal of Spine Surgery.
10. Acta orthopedica Scandinavia.
11. J. paed. Ortho.

Chapter III

Postgraduate Courses in Pediatrics

M. D. Pediatrics

Goals

The goals of postgraduate training in Pediatrics would be to train a basic medical graduate (MBBS) :

- To practice as a Child Health specialist equipped with appropriate knowledge and skills necessary to care for the normal and sick child.
- To practice Child Health in the community (urban or rural) and to perform professionally at all levels of the existing health care system.
- To practice with empathy and the highest ethical standards of the profession.
- To continue to strive for excellence by continuing medical education throughout his or her professional career.
- To teach by sharing knowledge and skills with colleagues
- To research and find solutions to challenges in health care.

Objectives.

The objectives to be fulfilled at the completion of the course are as follows:

At the end of the program, the student should be able to:

- Knowledge:
 - Describe, identify and monitor normal patterns of growth and development of children.
 - Describe etio-pathogenesis, principles of clinical diagnosis, investigations and treatment of diseases of childhood.
 - Demonstrate an understanding of Basic (Pre and Para-clinical) Sciences and its application to the normal and abnormal processes.
 - Analyze clinical and investigation data approach and manage a health-related problem.
 - Identify and understand socio-economic-environmental-cultural factors in health care.
 - Recognize problems outside his or her abilities and appropriately refer.
 - Update one's knowledge and skills by self directed learning and by participating in continued medical education programs utilizing media – spoken, written, Print and electronic.
 - Teach and share knowledge and skills with colleagues.
 - Audit and analyze work, assist in research and publish scientific articles in peer reviewed journals.
- Skills:
 - Elicit an appropriate clinical history.

- Demonstrate appropriate clinical physical examination skills on children.
 - Plan, decide upon and interpret appropriate cost effective investigations.
 - Perform essential procedures both diagnostic and therapeutic.
 - Manage, resuscitate and stabilize children in Pediatric or Neonatal emergencies.
- Communication and attitudes:
 - Communicate appropriately with guardians and children, assisting in their health care decision making.
 - Practice child health care at the highest ethical level, protecting the child at all costs.
 - Respect Patient's (and their guardian's) rights and professional relationships (Doctor-Doctor, Doctor-Nurse, Doctor-Patient, Doctor-Society).
 - Apply the highest level of ethics in Research, Publication, References and Practice of Pediatrics.

Course Contents

Knowledge

Must Know

The Field of Pediatrics

1. Evaluating Medical Literature
Critical Appreciation of Journal articles
2. Overview of Child Health
3. The Normal Child
4. Preventive and Social Pediatrics
5. Epidemiology, Statistics and Research
Methodology including Dissertation
6. Ethical Issues in Pediatrics

Knowledge

Desirable to know

1. History of Pediatrics
2. Traditions and Cultural Issues
pertaining to Child Care

Growth and Development

1. Biopsychological Models of Development
2. Fetal growth and development
3. The newborn G/D
4. Infant, Preschool, Early school, Adolescence G/D
5. Assessment of Growth
6. Development Assessment
7. Standards/Normograms (including Indian)
8. Approach to short stature
9. Approach to Obesity
10. Approach to Undernutrition

1. IQ assessment

Knowledge Must Know

Psychological Disorders

1. Assessment and Interviewing
CNS injury
2. Vegetative Disorders-Rumination,
Pica, Enuresis, Encopresis, Sleep
3. Habit Disorders
4. Anxiety Disorders
5. Suicide
6. ADHD
7. Autism
8. Poor Scholastic performance
in school age child
9. Psychosomatic Illness

Social Issues

1. Adoption
2. Street Child
3. ChildCare
4. Separation, death
5. Abuse and Neglect
6. Child Labor
7. Media (TV, Movies) and its effect
on the child

Children with Special Needs

1. Failure To Thrive – Problems,
Approach and Evaluation
2. Developmental disabilities, Chronic Illness
3. Mental Retardation – Problems, Approach
and Evaluation
4. Care of Child with fatal illness

Nutrition

1. Nutritional Requirements- Water, energy,
proteins, CHO, Fats, Minerals, Vitamins,
2. Diet/Nutrition Evaluation
3. Diet for later childhood and Adolescent
4. Infant and Child Feeding
5. Breast Milk Feeding, Human Lactation
Management, BFHI
6. Nutrition Values of Indian Foods, Recipes

Knowledge Desirable to Know

1. Psychiatric considerations of
2. Mood Disorders
3. Disruptive Behavioral disorders
4. Sexual behavior variations
5. Psychosis
6. Psychological treatment
7. Neurodevelopment dysfunction
8. Learning Disorders

1. Effects of a mobile society
2. Impact of Violence
3. Street Child
4. Single parent child
5. Foster care

1. Children in Poverty
2. Homeless children
3. Foster Children
4. Runaway Children

1. Athletic Diet

Knowledge Must Know

Knowledge Desirable to Know

7. Weaning foods
8. Feeding through 1 and 2nd years
9. Nutritional Disorders Including Obesity
10. Protein Energy Malnutrition
11. Vitamin Deficiencies and Excess
12. Micro-nutrient Malnutrition
13. Nutrition in Special situations – LBW, Premature, IEM, Chronic illness, Surgery, Critically ill child
14. TPN

Patho-physiology of Body Fluids and Fluid therapy (Approach and Management)

1. Physiology of Fluids, Electrolytes and Acid Bases
2. Dehydration and fluid management
3. Dyselectrolytemia
4. Acid Base Disorders
5. Special Situations - Pyloric stenosis, CNS disorders, Burns, Peri-operative, Endocrine disorders, Renal Failure.

Acutely Ill child

1. Evaluation in Emergency
2. Injury Control
3. Emergency Medical Services
4. Pediatric Critical Care
 - Respiratory Failure, Ventilation
 - Circulatory Failure and Shock
 - Acute Neurological Dysfunction
 - Resuscitation – Basic and Advanced, NALS/PALS
 - Post Resuscitation stabilization
 - Cold/Heat Injury
5. Transportation of Sick Child/neonate
6. Post-operative supportive care

1. Pediatric Anesthesia

2. Organization of a PICU/NICU
3. Equipment for Intensive care

Emergencies/ Critical Care Pediatrics

1. Fluid abnormalities
2. Electrolyte abnormalities
3. Thermoregulation problems
4. Acute Renal failure

Knowledge Must Know

Knowledge Desirable to Know

5. Hypertensive crisis
6. Congestive Cardiac failure
7. Cardiogenic shock
8. Pericardial tamponade
9. Cyanotic spells
10. Unstable and stable Arrhythmias
11. Vomiting and Diarrhea
12. GI Bleeds - Hematemesis, Melena, Hematochezia
13. Adrenal Crisis
14. Metabolic problems – hyperammonemia, lactic acidosis, acid base abnormalities, Hypoglycemia
15. Septicemic shock, Viral infections and shock
16. Pneumothorax, empyema, pleural effusion, ascites
17. Severe Anemia, Bleeding child, Neutropenia
18. Pain management, Drug therapy
19. ARDS
20. Respiratory Failure
21. Burns/ electrocution
22. Animal Bites
23. Preanesthetic check up PAC
24. Sick cell crisis, severe complicated malaria
25. Acute severe asthma, Bronchiolitis
26. Status epilepticus
27. Febrile seizure
28. Coma, Increased intra-cranial pressure
29. Cardiopulmonary resuscitation
30. Shock
31. Upper airway obstruction
32. Near drowning
33. Poisoning
34. Snake bite
35. Scorpion sting
36. Physical abuse
37. Sexual abuse

Human Genetics

1. Molecular Basis of Disorders
2. Molecular Diagnosis
3. Inheritance Patterns
4. Chromosomal/genetic clinical Abnormalities
5. Genetic Counseling

1. Human Genome Project

Knowledge Must Know

6. Dysmorphism
7. Gene therapy

Metabolic Disorders

1. Approach to IEM defects
2. Common amino acid Metabolic defects
3. Porphyria
4. Common Lipid Metabolism
5. Common CHO Metabolism
6. Mucopolysaccharidosis
8. Hypoglycemia

Fetus and Newborn

1. Mortality and morbidity
2. Newborn – history, examination, routine delivery care, nursery care, bonding
3. High risk pregnancies
4. Dysmorphology
5. Fetus
 - Growth/Development
 - Fetal distress
 - Maternal diseases
 - Maternal medications
 - Detection, treatment, prevention of fetal disease
 - Antenatal diagnosis
 - Fetal therapy
 - Antenatal therapy
 - Counseling
 - Teratogens, radiation
6. High risk infant
 - Multiple pregnancies
 - Prematurity
 - Postdated
 - IUGR/LBW
 - LFD

Knowledge Desirable to Know

1. Purine and pyrimidine metabolism
2. Rare Amino acid Metabolic Defects –
3. Rare Lipid Metabolism -
4. Rare CHO Metabolism –
5. Mucopolysaccharidosis

**Knowledge
Must Know**

**Knowledge
Desirable to Know**

7. Congenital anomalies/ malformations
8. Birth injuries
9. Hypoxia - ischemia, asphyxia
10. Organization and levels of newborn care
11. Normal Newborn
12. Common problems in a normal newborn
13. Delivery room emergencies
14. Respiratory disorders
15. Oxygen therapy, toxicity
16. Ventilation
16. GI disturbances including NEC
17. Hyperbilirubinemia
18. Cardiac problems
19. PPHN
20. Blood disorders
 - Polycythemia
 - Anemia
 - Hemorrhagic disease of newborn
 - Hemolytic disease of newborn
 - Thrombocytopenia
21. Genitourinary disturbances
22. Metabolic disorders
22. Endocrine disorders- IDM, CAH
23. Ambiguous genitalia
24. Fluid and electrolytes in Newborn care
25. Nutrition and feeding the newborn –
term/preterm, LBW, IUGR
26. Neonatal transport
27. Surgical problems
 - TEF
 - Anorectal malformations
 - Diaphragmatic Hernia/Eventration
 - Hirschsprung
 - Urogenital anomalies
 - NEC

Knowledge Must Know

Knowledge Desirable to Know

Congenital Lobar Emphysema
Volvulus

28. Thermoregulation
29. Neonatal follow-up

Neonatal Infections

1. Epidemiology
2. Intrauterine infections
3. Viral Infections
4. Neonatal sepsis/meningitis
5. Pneumonia
6. UTI
7. Hepatitis
8. Nosocomial
9. Universal precautions
10. Prevention of infections
11. Therapy- antimicrobials, adjuvants

Adolescent Health

1. Epidemiology
2. Sexual development and SMR stages
3. Deliveries of health care
4. Pregnancy
5. Contraception
6. STD
7. Menstrual problems
8. Anorexia nervosa, bulimia

1. Depression
2. Suicide
3. Substance abuse
4. Sleep disorders
5. Skin/Orthopedics

Immunological system

1. Basics of Immunology
2. Approach to immunodeficiency
3. HIV
4. Bone marrow transplantation
5. Primary B cell diseases
6. Primary T cell diseases
7. Complement and phagocytic diseases
8. Chronic granulomatous disease
9. Chediak Higashi Disease
10. Neutrophil abnormalities
11. Adhesion disorders

**Knowledge
Must Know**

**Knowledge
Desirable to Know**

Allergic disorders

1. Allergy and Immunological basis
2. Diagnosis
3. Therapy – principles
4. Allergic Rhinitis
5. Asthma
6. Atopic dermatitis
7. Urticaria, Angioedema
8. Anaphylaxis
9. Serum sickness
10. Adverse drug reactions

1. Insect allergy
2. Ocular allergy
3. Adverse food reaction

Rheumatology

1. Autoimmunity
2. Laboratory evaluation
3. JRA
4. SLE
5. Vasculitis
6. Dermatomyositis
7. Erythema Nodosum

1. Ankylosis spondylosis
2. Neonatal Lupus
3. Scleroderma
4. Mixed connective Tissue Disease

5. Behcet
6. Sjogren
7. Non rheumatic conditions
8. Pain syndromes, panniculitis,
polychondritis,
amyloidosis

Infectious diseases

1. Fever
2. Clinical use of Micro Lab
3. Fever without a focus
4. Sepsis and Shock
5. CNS Infections
6. Pneumonia
7. Gastroenteritis
8. Osteomyelitis, Septic arthritis
9. Compromised host infections
10. Bacterial Infections
11. Anaerobic infections

Knowledge Must Know

Knowledge Desirable to Know

12. Viral Infections
13. Mycotic infections
 - Candidiasis
 - Aspergillosis
14. Parasitic infections
 - Helminthiasis
15. Protozoal
 - Malaria
 - Kalazar
 - Leishmania
 - Giardia
 - Amoeba
16. Antiparasitic drugs
17. Antimicrobials
18. Antivirals drugs, interferon
19. Preventive measures
 - Health advice for travelling
 - Infection control
20. Immunization
 - Principles
 - Schedules
 - Controversies
 - Standard and Optional Vaccines
 - Recent advances in Vaccines

Digestive system

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Normal tract –
 Physiology, Anatomy, Development 2. Clinical features of Disorders 3. Disorders of Esophagus 4. Disorders of Stomach 5. Disorders of Intestines except Food allergy 6. Disorders of Pancreas 7. Disorders of Liver and biliary system
 Acute Hepatitis, Chronic Hepatitis, Cirrhosis,
 Metabolic Liver Diseases, Cholestatic liver disease,
 Neonatal Obstructive Cholangiopathy, Complications
 of Liver Disease – Portal Hypertension, Encephalopathy,
 Coagulopathy, 8. Disorders of Peritoneum | <ol style="list-style-type: none"> 1. Food allergy |
|--|---|

**Knowledge
Must Know**

**Knowledge
Desirable to Know**

9. GI function tests
10. Approach to Malabsorption

Respiratory system

1. Development and function
2. Disorders of Upper Respiratory tract
3. Disorders of Lower respiratory tract
4. Pleural disorders
5. Chronic Respiratory Disease
 Interstitial fibrosis, ILD, empyema,
 lung abscess, bronchiectasis
6. Recurrent Respiratory Disease
7. Ventilation
8. Pulmonary Function tests
9. Cystic Fibrosis
10. Obstructive sleep apnea
11. Pulmonary Hemosiderosis
12. Neuromuscular skeletal disorders
13. Bronchial Asthma

1. Congenital disorders of nose
2. Hypoventilation
3. Hypostatic pneumonia
4. Kyphoscoliosis
5. Central hyperventilation
6. Obesity

7. Cough Syncope

Cardiovascular System

1. Investigations –Lab, ECG, CXR, ECHO, Cath
2. Physiology and Pathophysiology of Transitional
Circulation
 Embryology
3. Congenital Heart Disease
 Epidemiology
 Approach
 Cyanotic
 Acyanotic
4. Cardiac Arrhythmia
5. Acquired heart disease
 Infective Endocarditis
 Rheumatic Heart Disease
6. Diseases of the Myocardium – Myocarditis,
Cardiomyopathy
7. Cardiac Therapeutics

1. Sick Sinus
2. Tumors of Heart
3. Heart Lung, Heart Transplants
4. Aneurysms and fistulae

Knowledge Must Know

Knowledge Desirable to Know

Blood

1. Development of Hematopoietic system
2. Anemias
 - Inadequate production
 - Nutrition – Iron, Folate, B12
 - Bone Marrow failure
 - Hemolytic
 - Congenital and Acquired
3. Constitutional pancytopenia
4. Polycythemia
5. Granulocyte transfusions
6. Pancytopenia
7. Blood and component transfusions
8. Thrombotic disorders
9. Hemorrhagic disorders – acquired and congenital
 - Physiology
 - Bleeding disorders
 - Coagulation disorders
10. Hyposplenism, trauma, splenectomy
11. Physiology and Disorders of the Spleen
12. Lymphatics

1. Elliptocytosis
2. Stomatocytosis
3. Other membrane defects

Neoplasms

1. Principles of diagnosis
2. Principles of treatment
3. Leukemia
4. Lymphomas
5. Neuroblastomas
6. Liver neoplasm
7. Kidney tumors
8. Bone Neoplasms
9. Retinoblastoma

1. Epidemiology
2. Molecular pathogenesis
3. Soft tissue sarcomas
4. Gonadal, germ cell tumours

5. GI neoplasm
6. Carcinomas
7. Skin Cancer
8. Benign tumours

Nephrology

1. Structure and function of kidney
2. Hematuria and conditions
3. HUS
4. Evaluation
5. Proteinuria
6. Nephrotic syndrome

1. Membranous GN
2. Lupus nephritis
3. Membr Prolif GN
4. Chronic infn GN
5. Goodpasture

Knowledge Must Know

7. Acute Glomerulonephritis
8. Tubular disorders
 - Function
 - RTA
 - DI
9. Renal Failure
10. RPGN
11. Renal Replacement therapy
12. Bartter syndrome
13. Investigations
14. Toxic nephropathy

Urological disorders

1. UTI
2. Congenital anomalies, dysgenesis kidney
3. Vesicoureteral reflux
4. Bladder anomalies
5. Obstructions
6. Penis, urethra anomalies
7. Voiding dysfunction
8. Scrotal anomalies
9. Genitourinary trauma
10. Urinary lithiasis
11. Investigations – imaging, renal function tests
12. Neurogenic bladder

Gynecological problems

1. Menstrual Problems
2. Vulvovaginitis
3. Developmental anomalies
4. A child with special gynea needs

Endocrine

1. Hypothalamus and pituitary
 - Hyperpituitarism
 - Hypopituitarism, Growth hormone
 - DI
 - ADH
 - Physiology of Puberty
 - Disorders of puberty

Knowledge Desirable to Know

7. Interstitial nephritis
8. Cortical necrosis

1. Neoplasms
2. Breast Disorders
3. Hirsutism, polycystic ovaries
4. Gyne imaging
5. Athletic problems

1. Carcinoma of thyroid

Knowledge Must Know

Knowledge Desirable to Know

Precocious Puberty
Delayed puberty

2. Thyroid

Thyroid studies
Hypothyroidism
Thyroiditis
Goitre
Hyperthyroidism

3. Parathyroid and disorders

4 Diabetes mellitus

5. Adrenal Disorders

CAH
Cushing
Addisons
Excess mineralocorticoids
Feminizing adrenal tumours
Pheochromocytoma

4. Tumours of testis/ovary

5. Multiple Endocrine Disorders

CNS

1. Examination, Localization of lesions

2. Congenital anomalies

3. Seizures

4. Headaches

5. Neurocutaneous disorders

6. Coma

7. Brain death

8. Head Injury

9. Neurodegenerative disorders- Approach, Grey/white

10. Acute Stroke

11. Brain abscess

12. Tumors

13. Spinal cord disorders

14. Investigations

15. Antiepileptic drugs

16. SSPE

17. Rabies Vaccine Encephalomyelitis,

18. Acute Demyelinating Encephalomyelitis

19. Approach, Investigations of UMN, LMN, Extrapyramidal, Cerebellar lesions

20. Cerebral Palsy

1. Movement disorders

Knowledge Must Know

21. Neuroinfections
22. Encephalopathies

Neuromuscular

1. Evaluation, investigations
2. Muscular Dystrophies, Congenital Myopathy, Myositis
3. Neuromuscular transmission and motor neuron abnormalities
4. GB syndrome
5. Bell's Palsy
6. Floppy Infant
7. Myasthenia Gravis

Eye

1. Examination of eye
2. Diseases of Eye movement and alignment disorders
3. Diseases of Conjunctiva - Conjunctivitis
6. Diseases of Lens - Cataracts
7. Diseases of Optic nerve – Papillitis, Neuritis, Papilledema
8. Diseases of Cornea - Clouding
8. Vitamin A deficiency
9. Lacrimal problems - Dacrocystitis
10. Retinopathy of Prematurity
11. VER

Ear

1. Clinical manifestations
2. Hearing loss
3. External Otitis
4. Otitis media
5. BAER

Skin

1. Morphology
2. Evaluation
3. Principles of therapy
4. Diseases of the neonate
5. Ectodermal dysplasias

Knowledge Desirable to Know

1. Development disorders of muscle
2. Endocrine
3. Metabolic
4. Motor sensory neuropathy
5. Autonomic

1. Refraction, accommodation
2. Vision
3. Pupils and iris
4. Lids
5. Uveal tract
6. Retina and vitreous
7. Glaucoma
8. Orbital abnormalities
9. Injuries to eye

1. Congenital malformations
2. Inner ear dis
3. Trauma
4. Tumors

1. Cutaneous defects
2. Hypersensitivity
3. Epidermis dis
4. Keratinization dis
5. Dermis dis

Knowledge Must Know

6. Vascular disorders
7. Cutaneous nevi
8. Pigment Disorders
 - Hyperpigmentation
 - Hypopigmentation
9. Vesiculobullous dis
10. Eczema
11. Cutaneous Infections – Bacterial, Viral, Fungal
12. Arthropod bites, infestations
13. Acne
14. Nutritional diseases
15. Drug Reactions

Bone/Joint

1. Evaluation
2. Diseases of Foot, toes
3. Torsional, angular deformities
4. Leg length discrepancy
5. Diseases of Knee
6. Diseases of Hip
7. Diseases of Spine
8. Diseases of Neck
9. Upper limb
10. Arthrogryposis
11. Common Fractures
12. Arthritis – approach, investigations, Management
12. Congenital Dislocation of Hip
13. Osteomyelitis
14. Septic Arthritis
15. Rickets – Nutritional and non nutritional

Genetic skeleton

1. Lethal and nonlethal bone dysplasias
2. Achondroplasia
3. Osteopetrosis
4. Marfans

Knowledge Desirable to Know

6. Subcutn dis
7. Sweat glands
8. Hair
9. Nails
10. Mucous membranes
11. Tumors
1. Sports medicine
2. Pseudoachondroplasia
3. Diagnosis, assessment of genetic skeletal disorders
4. Dysplasias - Thantophoric, diastrophic, camptomelic
5. Ellis van Creveld
6. Osteochondrodysplasia
7. Inherited osteoporosis
11. Hypophosphatasia
12. Primary Chondrodystrophy
13. Idiopathic hypercalcemia
14. Hyperphosphatasia

**Knowledge
Must Know**

**Knowledge
Desirable to Know**

Metabolic Bone disease

1. Bone and vitamin D
2. Familial Hypophosphatemia
3. Rickets – Nutritional and non nutritional

Unclassified disease

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. SIDS 2. Histiocytosis 3. Cystic fibrosis | <ol style="list-style-type: none"> 1. Sarcoidosis 2. Progeria 3. Chronic fatigue syndrome |
|---|--|

Environmental

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Lead poisoning 2. Envenomation 3. Mammalian bites 3. Common Poisonings – OP, Kerosene, Phenobarbitone, Iron, etc | <ol style="list-style-type: none"> 4. Radiation 5. Chemical pollutants 6. Mercury 7. Nonbacterial poisoning |
|--|---|

PEDAGOGY

Principles of learning, objectives, teaching learning methods, evaluation

HEALTH STATISTICS, NATIONAL PROGRAMS**ORGANIZATION OF OFFICE PRACTICE**

Equipment, Documentation, Records, Space and functioning

RECENT ADVANCES IN PEDIATRICS

DURATION 5 years

ALLIED SUBJECTS**Anatomy**

Applied Embryology, Development of major organ systems

Physiology

Applied Physiology with regard to major organ systems

Biochemistry

Biochemical basis or diseases in children – Nutritional and metabolic

Pathology

Pathophysiology of diseases in children, Pathogenesis, Basic Histo-pathology

Microbiology

Clinical Microbiology applied to investigations for diseases in childhood, serology, staining, cultures

Pharmacology

Clinical Pharmacology, Therapeutics of childhood diseases, drug interactions, Rational drug therapy, Adverse Drug Reactions,

Community Medicine

Health Care Delivery Systems – structure and function, Health Statistics, National Programs

Pediatric Surgery

Recognition and referral of surgical conditions in Pediatrics

Radiology

Clinical Indications and interpretations of Xray, Ultrasound, CT, MRI

Legal and Ethical Medicine

Rights and protection of children, Consumer Protection Act, Basic Principles of Ethics

I. Postgraduate skills

Please note code:

PI: Perform Independently

PA: Perform with assistance

O: Observe

Number at end of item indicates minimum number of supervised and documented skills.

Psychomotor skills**Procedural*****Procedures: List of PI Skills***

- | | |
|--|----|
| • Clinical History and Physical examination | - |
| • Human Lactation management (counseling and practical skills) | 20 |
| • Neonatal resuscitation | 30 |
| • Pediatric resuscitation | 30 |
| • Teaching encounters | 5 |
| • Intravenous injections | 50 |
| • Intravenous cannulation | 50 |
| • Lumbar puncture | 50 |
| • Test dose | 10 |
| • Infusions | 10 |
| • Blood transfusions | 10 |
| • Neonatal Exchange transfusions | 10 |

• ABG	10
• Central line, CVP	10
• Intraosseous	10
• Bone marrow aspiration, trephine biopsy	10
• Pleural tap	10
• Paracentesis – diagnostic and therapeutic	10
• Mantoux test	10
• DPT, OPV, Measles vaccination	10
• Sampling for Fluid cultures	10
• Liver biopsy	10
• Neonatal, Pediatric Partial exchange	5

Respiratory management (All PI)

• Nebulization	50
• Inhaler therapy	10
• Oxygen delivery	50

Critically Ill child (All PI)

• Monitoring a sick child	50
• Pulse oximetry	10
• Infant feeding tube/ Ryles tube, stomach wash	10
• Urinary catheterization	10
• Restraining a child for a procedure	10
• ORS and ORT	10
• Prognostication	10

Laboratory- Diagnostic (All PI)

• Urine Protein, sugar, microscopy	10
• Peripheral blood smear	10
• Malarial smear	10
• Ziehl Nielson smear – sputum, gastric aspirate	10
• Grams smear – CSF, pus	10
• Stool pH, reducing substances, microscopy	10
• KOH smear	2

Neonatal tests (All PI)

• Apt test	5
• Shake test	5

Clinical Assessment skills (All PI)

• Clinical History and Physical examination	-
• Anthropometry	50

• Dietary recall, calorie and protein estimation	50
• Nutritional advice	50
• Gestational assessment	10
• Neurological examination of newborn	10
• Primitive reflexes	10
• Fundoscopy	10
• Otoscopy	10
• Examination of external genitalia – male and female	10
• Tanner's SMR scales	5
• DDST or Baroda scales, TDS	5
• Amiel Telson's angles	5
• Per rectal examination	2

Interpretation (*All PI*)

• Clinical History and Physical examination	-
• Blood, Urine, CSF and Fluid investigations – hematology, biochemistry	50
• Chest Xray	50
• ECG	20
• ABG interpretation	20
• Abdominal Xray	20
• Bone and joint Xray	20
• CT scan Brain	20
• Barium studies	10
• IVP, VUR studies	10
• Ultrasound abdomen	10
• Neurosonogram	10

Communication skills

All PI:

- Clinical History and Physical examination
- Communicating health, disease
- Communicating about a seriously ill or mentally abnormal child
- Communicating death
- Informed consent
- Empathy with a family
- Referral letters, Replies
- Discharge summaries
- Death Certificates
- Pre-counseling for HIV

- Post counseling for HIV
- Basic Pedagogy sessions – teaching students, adults
- Lectures, bedside clinics, discussions
- Medline search, internet, Computer usage

List of Observations:

- Genetic counseling 2
- Classification of diseases 2

List of PA skills:

- Sedation 10
- Analgesia 10
- Brain death 10
- Intercostal tube placement with underwater seal 5

List of PA skills:

- Peritoneal dialysis 2
- Subdural, Ventricular tap 5

Teaching Learning Activities

Methods suggested for Pediatric Postgraduate Training Programs:

- **Didactic Lectures:** (Faculty lectures)

Objective: To introduce a broad-based concept in an important area of learning to orient the postgraduate student.

Examples: Potential introductory topics to Pediatrics like Fluid and Electrolytes, Early recognition of Shock and Respiratory Failure, DTTU management, Recent advances, Basic Science/ Concepts and ARI program.

Frequency: Three times a week during the introductory phase of the first one-two months of the new postgraduates joining the course. Following this period of orientation, it does not serve a purpose of self-directed learning and is best avoided as a regular activity except as an exceptional guest lecture.

- **Seminars:**

Objective: To enable a student to study in depth an important area of learning important to the training of the student.

Examples: Examples of potential seminar topics would be Protein Energy Malnutrition, Pediatric Tuberculosis, Pediatric HIV, Bronchial Asthma, Chronic Liver Disease and its complications.

Frequency: Three times a month. Topics to rotate once every 2-3 years (DCh, MD). Topic to be shared among 2-3 students and to be equally distributed depending upon the number of postgraduate students in the department.

- **Journal Club:**

Objective: To appreciate and enable the critical analysis of scientific literature published in peer reviewed journals – studies, reviews.

Examples: Articles like the study on prophylactic Zidovudine to HIV positive pregnant women in prevention of vertical transmission to the fetus, Digoxin versus Captopril in VSD in CCF, etc.

Frequency: Ideally, once in 1-2 months. MDs get the first opportunity and juniors begin after their first year in the course.

- **Undergraduate Teaching Clinics**

Objective: To teach effectively undergraduate and colleagues utilizing simple educational methods.

Methodology: During the third year of MD course, postgraduate students should be given opportunities to teach undergraduates.

Examples: Bedside Clinic, Didactic lecture, skill workshop (e.g. NALS, PALS)

Frequency: During undergraduate postings in the department each postgraduate should have a minimum of 2 opportunities per year after the first year of the postgraduate course is completed.

- **Bedside Clinics**

Objective: To learn bedside techniques - interview, physical examination, analysis, diagnostic decision making, investigation decisions, treatment and communication.

Examples: Child with hemiplegia, hepatosplenomegaly, anemia, jaundice, etc.

Frequency: Once in a week is the minimum as it forms the basis of good clinical training activities.

- **Mortality Review Meeting**

Objective: To analyze, discuss and learn from mortalities.

Frequency: Once in a month preferably in the first week to allow the previous months mortality to be presented for discussion.

- **Grand Rounds**

Objective: To improve on bedside techniques – interview, physical examination, analysis, diagnostic decision making, investigation decisions, treatment, communication.

Examples: The child with pyrexia of unknown origin, undiagnosed hepatosplenomegaly, multi-systemic disease.

Frequency: Once in a week presuming the Head of Unit or Department does not daily interfere with the day to day management of the ward except in special circumstances.

- **Inter-departmental Meetings**

Objective: To experience inter-departmental cooperation and develop a healthy professional respect for each others opinions in addition to the subject learning experience.

Methodology: Case discussions or students present investigations to members of both faculty. The discussion is a learning experience and improves communications between departments.

Examples: Chest X-rays of a complicated bronchopneumonia progressing to an empyema, CT scans of intra-cranial pathology, Tracheo-esophageal fistulae and supportive care.

Frequency: Once or twice in a month and rotated between departments – Radiology, Pediatric Surgery, Cardiology, Nephrology, Neurology, Clinical Hematology, etc.

- **Clinical Pathological Conference CPC**

Objective: To analyze clinical material to reach a differential diagnosis and correlate with the pathological biopsy findings.

Frequency: Once in two months. First choice is a senior MD student. All are encouraged to participate.

- **Records Round**

Objective: To appreciate the importance of documentation of facts and record keeping.

Methodology: Faculty in the presence of the team scrutinizes random case records. History sheets, doctor order sheets, progress sheets and discharge summaries are discussed.

Frequency: Once a week with the entire team present at the session.

Dissertation

1. Every candidate pursuing degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
2. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
3. Every candidate shall submit to the Registrar (Academic), RGUHS, in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
4. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.
5. The dissertation should be written under the following headings:
 - i. Introduction
 - ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion
 - vii. Conclusion
 - viii. Summary
 - ix. References (Vancouver style)
 - x. Tables
 - xi. Annexures
6. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other

annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

7. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.
8. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
9. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Rotation Postings

Core

Pediatrics	--	18 - 23 months
Neonatology	--	6 - 8 months
Intensive Care/Emergency	--	2 - 3 months

Optional Specialities (optional subject to availability) -- 6 months

Oncology
 Neurology
 Pediatric Surgery
 Nephrology
 Cardiology
 Clinical Hematology
 Dermatology
 Pulmonology
 Gastroenterology
 Clinical Microbiology
 Community/Rural

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trustworthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) **Clinical skills**

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills* : Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) *Dissertation in the Department* : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book*- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

a) Theory

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows.

Paper I : Fetal and newborn

Paper II : General Pediatrics I*

* General Paediatrics I includes: -Respiratory, CNS, Hematology, Nutrition, Growth and Development, Oncology, Endocrine, Metabolic, Allergy/Immunology, Psychiatry.

Paper III : General Paediatrics II**

Includes: Infection, Gastroenterology, Hepatology, Immunization, Renal, CVS, Surgical, Adolescent, Collagen Vascular, Miscellaneous.

Paper IV : Ambulatory (OPD) Pediatrics, Community and Social Pediatrics, Emergency and Critical Care Pediatrics

Basic Sciences and Recent Advances as applied to clinical paediatric disorders should be **incorporated** into relevant and appropriate question papers covering the respective areas.

Note: The distribution of chapters / topics shown against the papers are suggestive only.

b) Clinical Examination 200 Marks

	No. of Cases	Marks
Long case	1	80
Short Case	1	45
OPD case	1	25
Emergency case	1	25
Newborn	1	25
Total	5	200

c) Viva – voice: 100 marks

1) Viva-Voce Examination: (80 Marks)

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may also be given case reports, charts, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, for interpretation. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 Marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

d)

Maximum marks for M.D. degree course	Theory	Practical	Viva	Grand Total
	400	200	100	700

Recommended Books and Journals

Texts:

Essential

1. Nelson's Textbook of Pediatrics, Harcourt Asia Saunders
2. Cloherty's Manual of Neonatal Care
3. Meharban Singh's Care of the Newborn
4. Harriat Lane
5. Manual of Pediatric Therapeutics, Little Brown's Children's Hospital, Boston.
6. O.P. Ghai's Textbook of Pediatrics

Reference

1. Rudolf's Pediatrics, Appelton and Lange
2. Forfar and Arneil's Textbook of Pediatrics, ELBS
3. Frank Oski's Principles and Practice of Pediatrics
4. Avery's Disease of the Newborn
5. Robertson's Textbook of Neonatology
6. Illingworth's The normal child
7. Guha's Textbook of Neonatology
8. IAP Textbook of Pediatrics
9. Nadas' Pediatric Cardiology
10. Perloff's Approach to Congenital Heart Disease
11. Moss and Adam's Heart Disease in Infants, children and Adolescent
12. Miller's Blood Diseases of Infancy and Childhood
13. DeGruchy's Clinical Hematology in Medical Practice
14. Barret and Holiday's Pediatric Nephrology
15. Caffey's Pediatric X-Ray diagnosis
16. Alleyne's Protein Energy Malnutrition
17. Miller, Tuberculosis
18. Vimlesh Seth, Tuberculosis
19. Swanson's Pediatric Surgery
20. Cherry and Feigen's Pediatric Infectious Diseases
21. Fenichel's Pediatric Neurology
22. Kendig's Respiratory Diseases in Pediatrics
23. Alex Mowat's Liver Disease in Children
24. Roger's Pediatric Critical Care
25. H.P.S. Sachdev's Principles of Pediatric and Neonatology Emergencies
26. Smith's Recognition patterns of Human Malformations

Indexed Journals

1. Indian Pediatrics
2. Indian Journal of Pediatrics
3. Pediatric Clinics of North America
4. New England Journal of Medicine
5. Lancet
6. British Medical Journal
7. Journal of Pediatrics
8. Archives Disease of Childhood and Adolescence
9. Pediatrics
10. Perinatal Clinics of North America

Reference Series

1. Suraj Gupta's Recent Advances in Pediatrics
2. David's Recent Advances in Pediatrics
3. Advances in Pediatrics
4. Year Book of Pediatrics

Annexure

Record to be maintained by Post graduate students

Name	Academics			Service		Skills		Responsibility	
Name	Teaching Programs	Discussion	Patient work up	Patient Care	Procedure	Communication	Discipline	Punctuality	Anecdotal events +/-

Pediatric Postgraduate Training Log bookContents:**1. Personal Data:**

Name
 Institution
 Dates of Postgraduation studies
 Joining
 Completion
 Degree
 University
 Dissertation Title
 Name and Designation of Guide
 Signature of candidate
 Signature of Supervisor
 Signature of Head of Department

2. Professional Education: (eg. MBBS, DCh)

Degree	Institution	University	Dates of Training

3. Professional Experiences: (eg. SHO Pediatrics, CMO, Tutor)

Professional Post	Institution	Dates of Work period

4. Clinical Postings: (eg. General Pediatrics, PICU, NICU, Oncology, Neurology)

Speciality	Duration	Dates of Posting

5. Case Presentations: (eg. Clinics, tutorials)

Date	Name/age/sex	Problem/ Diagnosis	Grade	Supervisor

6. Seminars: (eg. Seminar on TB)

Date	Topic Presentation	of	Grade	Supervisor

7. Mortality Meetings (eg. Mortality case discussion)

Date	Name/age/sex	Problem/ Diagnosis	Supervisor

8. Multi-disciplinary Meetings (eg. Urinary Lithiasis with Urology and Nephrology)

Date	Topic	Departments involved

9. Community Activity: (eg. Pulse polio, Education programs, Rural visits, Slum visits)

Date	Description of Activity	Supervisor

10. Paper Presentation (*Local, State, National, International Forum- eg. IAP local meetings, NNF meetings*)

Date	Title of Paper presented	Supervisor

11. Undergraduate Classes taken by MD candidate (*eg. Didactic lecture or clinic*)

Date	Topic	Supervisor

12. Academic Meetings, CMEs and Conferences attended (*Extra mural: Local, State, National, International Forum- eg. IAP local meetings, NNF meetings*)

Date	Title	Organization

13. Training Courses (*eg. BFHI Lactation course, PALS, NALS, Research Methodology*)

Date	Title	Supervisor

Diploma in Child Health (DCH)

Goals

The goals of postgraduate training in Pediatrics would be to train a basic medical graduate (MBBS) :

- To practice as a Child Health specialist equipped with appropriate knowledge and skills necessary to care for the normal and sick child.
- To practice Child Health in the community (urban or rural) and to perform professionally at all levels of the existing health care system.
- To practice with empathy and the highest ethical standards of the profession.
- To continue to strive for excellence by continuing medical education throughout his or her professional career.
- To teach by sharing knowledge and skills with colleagues
- To research and find solutions to challenges in health care.

Objectives

The objectives to be fulfilled at the completion of the course are as follows:

At the end of the program, the student should be able to:

- Knowledge:
 - Describe, identify and monitor normal patterns of growth and development of children.
 - Describe etio-pathogenesis, principles of clinical diagnosis, investigations and treatment of diseases of childhood.
 - Demonstrate an understanding of Basic (Pre and Para-clinical) Sciences and its application to the normal and abnormal processes.
 - Analyze clinical and investigation data approach and manage a health-related problem.
 - Identify and understand socio-economic-environmental-cultural factors in health care.
 - Recognize problems outside his or her abilities and appropriately refer.
 - Update one's knowledge and skills by self directed learning and by participating in continued medical education programs utilizing media – spoken, written, Print and electronic.
 - Teach and share knowledge and skills with colleagues.
 - Audit and analyze work, assist in research and publish scientific articles in peer reviewed journals.
- Skills:
 - Elicit an appropriate clinical history.

- Demonstrate appropriate clinical physical examination skills on children.
 - Plan, decide upon and interpret appropriate cost effective investigations.
 - Perform essential procedures both diagnostic and therapeutic.
 - Manage, resuscitate and stabilize children in Pediatric or Neonatal emergencies.
- Communication and attitudes:
 - Communicate appropriately with guardians and children, assisting in their health care decision making.
 - Practice child health care at the highest ethical level, protecting the child at all costs.
 - Respect Patient's (and their guardian's) rights and professional relationships (Doctor-Doctor, Doctor-Nurse, Doctor-Patient, Doctor-Society).
 - Apply the highest level of ethics in Research, Publication, References and Practice of Pediatrics.

Course Contents

Knowledge Must Know	Knowledge Desirable to Know
The Field of Pediatrics	
1. Evaluating Medical Literature Critical Appreciation of Journal articles	1. History of Pediatrics
2. Overview of Child Health	2. Traditions and Cultural Issues pertaining to child care
3. The Normal Child	
4. Preventive and Social Pediatrics	
5. Epidemiology, Basic Statistics	
6. Ethical Issues in Pediatrics	
Growth and Development	
1. Biopsychological Models of Development	1. IQ assessment
2. Fetal growth and development	
3. The newborn G/D	
4. Infant, Preschool, Early school, Adolescence G/D	
5. Assessment of Growth	
6. Development Assessment	
7. Standards/Normograms (including Indian)	
8. Approach to short stature	
9. Approach/management of Obesity	

Knowledge Must Know

10. Approach/management of Undernutrition
11. Approach/management of failure to thrive
12. Approach/management of developmental delay, regression of milestones

Psychological Disorders

1. Assessment and Interviewing
2. Vegetative Disorders-Rumination, Pica, Enuresis, Encopresis, Sleep
3. Habit Disorders
4. Anxiety Disorder
5. ADHD
6. Psychosomatic Illness

Social Issues

1. Street Child
2. childcare
3. Separation, death
4. Abuse and Neglect
5. Child Labor
6. Media (TV, Movies) and its effect on the child

Children with Special Needs

1. Failure To Thrive – Problems, Approach and Management
2. Developmental disabilities, Chronic Illness
3. Mental Retardation – Problems, Approach and management
4. Care of Child with fatal illness

Nutrition

1. Nutritional Requirements- Water, energy, proteins, CHO, Fats, Minerals, Vitamins,
2. Diet/Nutrition Evaluation
3. Diet for later childhood and Adolescent
4. Infant and Child Feeding
5. Breast Milk Feeding, Human Lactation Management, BFHI
6. Nutrition Values of Indian Foods, Recipes
7. Weaning foods
8. Feeding through 1 and 2nd years
9. Nutritional Disorders Including Obesity

Knowledge Desirable to Know

1. Autism
2. Suicide
3. Neurodevelopment dysfunction in School age child
4. Learning Disorders

1. Adoption

1. Children in Poverty

1. TPN

**Knowledge
Must Know**

**Knowledge
Desirable to Know**

10. Protein Energy Malnutrition
11. Vitamin Deficiencies and Excess
12. Micro-nutrient Malnutrition
Premature,

2. Nutrition in Special situations – LBW, IEM, Chronic illness, Surgery, Critically ill child

**Patho-physiology of Body Fluids and Fluid therapy
(Approach and Management)**

1. Physiology of Fluids, Electrolytes and Acid Bases
2. Dehydration and fluid management
3. Dyselectrolytemia
4. Acid Base Disorders
5. Approach and Management of dyselectrolytemia and acid-base abnormalities

1. Special Situations - Pyloric stenosis, CNS disorders, Burns, Peri-operative, Endocrine disorders, Renal Failure.

Acutely Ill child (Approach and Management)

1. Evaluation in Emergency
2. Injury Control
3. Emergency Medical Services
4. Pediatric Critical Care

1. Basics of Pre Anesthesia Check up

2. Level II equipment for Intensive care

Respiratory Failure, Concepts of Ventilation

Circulatory Failure and Shock

Acute Neurological Dysfunction

Resuscitation – Basic and Advanced, NALS/PALS

Post Resuscitation stabilization

Cold/Heat Injury

5. Transportation of Sick Child/neonate

**Emergencies/ Critical Care Pediatrics
(Approach and Management)**

1. Fluid abnormalities
2. Electrolyte abnormalities
lactic acidosis,
3. Thermoregulation problems
4. Acute Renal failure
5. Hypertensive crisis
6. Congestive Cardiac failure
7. Cardiogenic shock
8. Pericardial tamponade
9. Cyanotic spells

1. Unstable and stable Arrhythmias
2. Metabolic - hyperammonemia,
3. Pre-anesthetic check up PAC

**Knowledge
Must Know**

**Knowledge
Desirable to Know**

10. Vomiting and Diarrhea
11. GI Bleeds - Hematemesis, Melena, Hematochezia
12. Adrenal Crisis
13. Metabolic problems –acid base abnormalities, Hypoglycemia
14. Septicemic shock, Viral infections and shock
15. Pneumothorax, empyema, pleural effusion, ascites
16. Severe Anemia, Bleeding child, Neutropenia
17. Pain management, Drug therapy
18. ARDS
19. Respiratory Failure
20. Burns/ electrocution
21. Animal Bites
22. Sickle cell crisis, severe complicated malaria
23. Acute severe asthma, Bronchiolitis
24. Status epilepticus
25. Febrile seizure
26. Coma, Increased intra-cranial pressure
27. Cardiopulmonary resuscitation
28. Shock
29. Upper airway obstruction
30. Near drowning
31. Poisoning
32. Snake bite
33. Scorpion sting
34. Physical abuse
35. Sexual abuse

Human Genetics

1. Inheritance Patterns
2. Chromosomal/genetic clinical Abnormalities
3. Genetic Counseling
4. Dysmorphism

1. Molecular Basis of Disorders
2. Molecular Diagnosis
3. Human Genome Project
4. Gene therapy

Metabolic Disorders (Approach and Management)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Approach to IEM 2. Hypoglycemia | <ol style="list-style-type: none"> 1. Purine and pyrimidine metabolism defects 2. Amino acid Metabolic Defects 3. Lipid Metabolism – Common 4. CHO Metabolism – Common 5. Mucopolidosis, Mucopolysaccharidosis 6. Aminoacid Metabolic defects - Common |
|---|--|

1. Mortality and morbidity
2. Newborn – history, examination, routine delivery care, nursery care, bonding
3. High risk pregnancies
4. Dysmorphology
5. Fetus
 - Fetal distress
 - Maternal diseases
 - Maternal medications
6. High risk infant
 - Multiple pregnancies
 - Prematurity
 - Postdated
 - IUGR/LBW
 - LFD
6. Congenital anomalies/ malformations- Recognition and Referral
7. Birth injuries
8. Hypoxia - ischemia, asphyxia
9. Normal Newborn
10. Common problems in a normal newborn
11. Delivery room emergencies
12. Respiratory disorders
13. Oxygen therapy, toxicity
16. Basics of Ventilation
14. GI disturbances including NEC
15. Hyperbilirubinemia
16. Cardiac problems
17. Blood disorders
 - Polycythemia
 - Anemia
 - Hemorrhagic disease of newborn
 - Hemolytic disease of newborn
 - Thrombocytopenia
18. Metabolic disorders
19. Endocrine disorders- IDM, CAH- Recognition and Referral
20. Ambiguous genitalia - Recognition and Referral
21. Fluid and electrolytes in Newborn care
22. Nutrition and feeding the newborn – term/preterm, LBW, IUGR
23. Neonatal transport
24. Surgical problems – Recognition and referral
25. Thermoregulation
26. Neonatal follow-up

**Knowledge
Must Know**

**Knowledge
Desirable to Know**

Neonatal Infections (Approach and Management)

1. Epidemiology
2. Intrauterine infections
3. Viral Infections
4. Neonatal sepsis/meningitis
5. Pneumonia
6. UTI
7. Hepatitis
8. Nosocomial
9. Universal precautions
10. Prevention of infections
11. Therapy- antimicrobials, adjuvants

Adolescent Health

1. Epidemiology
2. Sexual development and SMR stages
3. Deliveries of health care
4. Menstrual problems - Recognition and Referral

1. Pregnancy
2. Contraception
3. STD

Immunological system

1. Basics of Immunology
2. Approach to immunodeficiency
3. HIV

1. Bone marrow transplantation

Allergic disorders

1. Allergy and Immunological basis
2. Diagnosis
3. Therapy – principles
4. Allergic Rhinitis
5. Asthma
6. Atopic dermatitis
7. Urticaria, Angioedema
8. Anaphylaxis
9. Serum sickness
10. Adverse drug reactions

1. Insect allergy
2. Ocular allergy
3. Adverse food reaction

Rheumatology (Approach and Management)

1. Autoimmunity
2. Laboratory evaluation
3. JRA
4. SLE
5. Erythema Nodosum

1. Vasculitis
2. Dermatomyositis

**Knowledge
Must Know**

**Knowledge
Desirable to Know**

Infectious diseases (Approach and Management)

1. Fever
2. Clinical use of Micro Lab
3. Fever without a focus
4. Sepsis and Shock
5. CNS Infections
6. Pneumonia
7. Gastroenteritis
8. Osteomyelitis, Septic arthritis
9. Compromised host infections
10. Bacterial Infections
11. Anaerobic infections
12. Viral Infections
13. Mycotic infections
 - Candidiasis
 - Aspergillosis
14. Parasitic infections
 - Helminthiasis
15. Protozoal
 - Malaria
 - Kalazar
 - Leishmania
 - Giardia
 - Amoeba
16. Antiparasitic drugs
17. Antimicrobials
18. Antivirals drugs, interferon
19. Preventive measures
 - Health advice for travelling
 - Infection control

Immunization

Principles, Schedules, Controversies, Standard and Optional Vaccines, Recent advances in Vaccines

Digestive system (Approach and Management)

1. Normal tract – Physiology, Anatomy, Development
2. Clinical features of Disorders
3. Esophagitis, GER, Achalasia
4. Ulcer, Acid Peptic Disease, GI bleeds
5. Malabsorption, Obstruction,
6. Pancreatitis
7. Disorders of Liver and biliary system

**Knowledge
Must Know**
**Knowledge
Desirable to Know**

Acute Hepatitis, Chronic Hepatitis, Cirrhosis,
Metabolic Liver Diseases, Cholestatic liver disease,
Neonatal Obstructive Cholangiopathy, Complications
of Liver Disease – Portal Hypertension, Encephalopathy,
Coagulopathy,

8. Peritonitis
9. GI function tests
10. Approach to Malabsorption

Respiratory system (Approach and Management)

1. Development and Physiological function
2. Disorders of Upper Respiratory tract
3. Disorders of Lower respiratory tract
4. Pleural disorders
5. Chronic Respiratory Disease

Interstitial fibrosis, ILD, empyema, lung abscess,
bronchiectasis

6. Recurrent Respiratory Disease
7. Basics/Indications of Ventilation
8. Bronchial Asthma

1. Pulmonary Function tests
2. Cystic Fibrosis

Cardiovascular System (Approach and Management)

1. Investigations –Lab, ECG, CXR,
2. Physiology and Pathophysiology of Transitional Circulation
Embryology
3. Congenital Heart Disease
Epidemiology
Approach
Cyanotic
Acyanotic
4. Acquired heart disease
Infective Endocarditis
Rheumatic Heart Disease
4. Diseases of the Myocardium – Myocarditis, Cardiomyopathy
5. Cardiac Therapeutics

1. ECHO
2. Cardiac Arrhythmia

Blood (Approach and Management)

1. Anemia
Inadequate production
Nutrition – Iron, Folate, B12

1. Development of Hematopoietic system

Knowledge Must Know

Knowledge Desirable to Know

Bone Marrow failure
Hemolytic
Congenital and Acquired

2. Constitutional pancytopenia

3. Pancytopenia

4. Blood and component transfusions

5. Hemorrhagic disorders – acquired and congenital

Physiology

Bleeding disorders

Coagulation disorders

6. Hyposplenism, trauma, splenectomy

7. Physiology and Disorders of the Spleen

Neoplasms (Approach and Management)

1. Principles of diagnosis

2. Principles of treatment

3. Leukemia

4. Lymphomas

2. Granulocyte transfusions

1. Neuroblastomas

2. Liver neoplasm

3. Kidney tumors

4. Retinoblastoma

Nephrology (Approach and Management)

1. Structure and function of kidney

2. Hematuria and conditions

3. HUS

4. Evaluation

5. Proteinuria

6. Nephrotic syndrome

7. Acute Glomerulonephritis

8. Renal Failure

9. Investigations

1. Tubular disorders

2. RPGN

3. Renal Replacement therapy

Urological disorders (Approach and Management)

1. UTI

2. Vesicoureteral reflux

3. Obstructions

4. Investigations – imaging, renal function tests

1. Penis, urethra anomalies

2. Urinary lithiasis

3. Scrotal anomalies

Gynecological problems (Approach and Management)

1. Mentruation – Normal

1. Menstrual Problems

Knowledge Must Know

2. Vulvovaginitis

Endocrine (Approach and Management)

1. Physiology of Puberty
2. Thyroid
 - Thyroid studies
 - Hypothyroidism
 - Thyroiditis
 - Goitre
3. Diabetes mellitus
- Adrenal Disorders
 - CAH
 - Cushing
 - Addisons

4. Approach to short stature

CNS (Approach and Management)

1. Examination, Localization of lesions
2. Congenital anomalies
3. Seizures
4. Headaches
5. Coma
6. Brain death
7. Head Injury
8. Acute Stroke
9. Brain abscess
10. Tumors
11. Investigations
12. Antiepileptic drugs

Knowledge Desirable to Know

2. Breast Disorders
3. Developmental anomalies
4. A child with special gynea needs

1. Hypothalamus and pituitary
 - Hyperpituitarism
 - Hypopituitarism,
 - Growth hormone
 - DI

ADH

2. Disorders of puberty
 - Precious Puberty
3. Parathyroid and disorders

4. Adrenal-Excess mineralocorticoids
 - Feminizing adrenal tumours
 - Pheochromocytoma
5. Hyperthyroidism

1. Neurocutaneous disorders
2. Neurodegenerative disorders-
 - Approach, Grey/white
3. Spinal cord disorders
4. SSPE

Knowledge Must Know

13. Rabies Vaccine Encephalomyelitis,
14. Acute Demyelinating Encephalomyelitis
15. Approach, Investigations of UMN, LMN, Extrapyramidal, Cerebellar lesions
16. Cerebral Palsy
17. Neuroinfections
18. Encephalopathies

Neuromuscular (Approach and Management)

1. Evaluation, investigations
2. Muscular Dystrophy
3. GB syndrome
4. Bell's Palsy
5. Floppy Infant

Eye

1. Examination of eye
2. Squint
5. Diseases of Conjunctiva - Conjunctivitis
5. Diseases of Lens – Cataracts
6. Papilledema
7. Vitamin A deficiency
8. Lacrimal problems - Dacrocystitis

Ear

1. Clinical manifestations
2. Hearing loss
3. External Otitis
4. Otitis media

Skin

1. Eczema
2. Cutaneous Infections – Bacterial, Viral, Fungal
3. Arthropod bites, infestations
4. Acne
5. Nutritional diseases
6. Drug Reactions
7. Atopic dermatitis

Knowledge Desirable to Know

1. Congenital Myopathy, Myositis
2. Neuromuscular transmission and motor neuron abnormalities
3. Myasthenia Gravis

1. Refraction, accommodation
2. Vision
3. Injuries to eye
4. Diseases of Eye movement and alignment disorders
5. Diseases of Optic nerve – Papillitis, Neuritis
6. Diseases of Cornea – Clouding
7. Retinopathy of Prematurity
8. Visual evoked response

1. Congenital malformations
2. Inner ear dis
3. Trauma
4. BAER

1. Leprosy

**Knowledge
Must Know**

**Knowledge
Desirable to Know**

Bone/Joint

1. Evaluation
2. Arthritis – approach, investigations, Management
3. Congenital Dislocation of Hip
4. Osteomyelitis
5. Septic Arthritis
6. Rickets – Nutritional and non nutritional

1. Lethal and nonlethal bone dysplasias
2. Achondroplasia
3. Osteopetrosis
4. Marfans

Metabolic Bone disease

1. Bone and vitamin D
2. Rickets – Nutritional and non nutritional

Unclassified disease

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. SIDS | <ol style="list-style-type: none"> 1. Histiocytosis 2. Cystic fibrosis |
|---|--|

Environmental

1. Lead poisoning
2. Envenomation
3. Mammalian bites
4. Common Poisonings – OP, Kerosene, Phenobarbitone, Iron, etc

HEALTH STATISTICS, NATIONAL PROGRAMS**ORGANIZATION OF OFFICE PRACTICE**

Equipment, Documentation, Records, Space and functioning

**RECENT ADVANCES IN PEDIATRICS especially with regard applied clinical common
Pediatric problems**

DURATION 5 years

ALLIED SUBJECTS**Anatomy**

Applied Anatomy

Physiology

Applied Physiology with regard to major organ systems

Biochemistry

Biochemical basis or diseases in children – Nutritional and metabolic

Pathology

Pathophysiology of diseases in children, Pathogenesis, Basic Histo-pathology

Microbiology

Clinical Microbiology applied to investigations for diseases in childhood, serology, staining, cultures

Pharmacology

Clinical Pharmacology, Therapeutics of childhood diseases, drug interactions, Rational drug therapy, Adverse Drug Reactions,

Community Medicine

Health Care Delivery Systems – structure and function, Health Statistics, National Programs

Pediatric Surgery

Recognition and referral of surgical conditions in Pediatrics

Radiology

Clinical Indications and interpretations of Xray, Ultrasound, CT, MRI

Legal and Ethical Medicine

Rights and protection of children, Consumer Protection Act, Basic Principles of Ethics

Postgraduate Skills

Please note code:

PI: Perform Independently

PA: Perform with assistance

O: Observe

Number at end of item indicates minimum number of supervised and documented skills.

Psychomotor skills**Procedural****Procedures: List of PI Skills**

▪ Clinical History and Physical examination	-
• Breast Feeding Management Skills	20
• Neonatal resuscitation – Basic and Advanced	20
• Pediatric resuscitation – Basic and Advanced	20
• Intravenous injections	30
• Intravenous cannulation	30
• Lumbar puncture	25
• Test dose	10
• Infusions	10
• Mantoux test	10
• DPT, OPV, Measles vaccination	10
• Blood transfusions	5
▪ Neonatal Exchange transfusions	5

• ABG	5
• Central line, CVP	5
• Intraosseous	5
• Bone marrow aspiration, trephine biopsy	5
• Pleural tap	5
• Paracentesis – diagnostic and therapeutic	5
• Sampling for Fluid cultures	5
• Liver biopsy	5
• Neonatal, Pediatric Partial exchange	2

Respiratory management (All PI)

• Nebulization	30
• Inhaler therapy	10
• Oxygen delivery	30

Critically Ill child (All PI)

• Monitoring a sick child	25
• ORS and ORT	10
• Infant feeding tube/ Ryles tube, stomach wash	5
• Urinary catheterization	5
• Restraining a child for a procedure	5
• Prognostication	-

Microbiology/ Pathology (All PI)

• Urine Protein, sugar, microscopy	5
• Peripheral blood smear	5
• Malarial smear	5
• Ziehl Nielson smear – sputum, gastric aspirate	5
• Grams smear – CSF, pus	5
• Stool pH, reducing substances, microscopy	5
• KOH smear	1

Neonatal tests (All PI)

• Apt test	2
• Shake test	2

Assessment skills (All PI)

• Anthropometry	30
• Dietary recall, calorie and protein estimation	30
• Nutritional advice	30
• Fundoscopy	10
• Otoscopy	10
• Gestational assessment	5
• Neurological examination of newborn	5

- Primitive reflexes 5
- Examination of external genitalia – male and female 5
- Tanner's SMR scales 2
- DDST or Baroda scales, TDS 2
- Amiel Telson's angles 2
- Per rectal examination 1

Interpretation (*All PI*)

- Clinical History and Physical examination -
- Blood, Urine, CSF and Fluid investigations – hematology, biochemistry 30
- Chest Xray 30
- ECG 10
- Abdominal Xray 10
- ABG interpretation 5

All PA

- CT scan Brain 10
- Bone and joint Xray 5
- Barium studies 5
- IVP, VUR studies 5
- Ultrasound abdomen 5
- Neurosonogram 5

Communication skills

All PI:

- Clinical History and Physical examination -
- Communicating management details -
- Communicating good health, disease -
- Communicating about a seriously ill or mentally abnormal child -
- Communicating death -
- Informed consent -
- Empathy with a family -
- Referral letters, Replies -
- Discharge summaries -
- Death Certificates -
- Pre-counseling for HIV -
- Post counseling for HIV -

List of Observations:

- Genetic counseling 2
- Classification of diseases 2

List of PA skills:

- Sedation 5

• Analgesia	5
• Death declarations	-
• Intercostal tube placement with underwater seal	2
• Peritoneal dialysis	1
• Subdural, Ventricular tap	2

Teaching Learning Activities

Methods suggested for Pediatric Postgraduate Training Programs:

- **Didactic Lectures:** (Faculty lectures)

Objective: To introduce a broad-based concept in an important area of learning to orient the postgraduate student.

Examples: Potential introductory topics to Pediatrics like Fluid and Electrolytes, Early recognition of Shock and Respiratory Failure, DTTU management, Recent advances, Basic Science/ Concepts and ARI program.

Frequency: Three times a week during the introductory phase of the first one-two months of the new postgraduates joining the course. Following this period of orientation, it does not serve a purpose of self-directed learning and is best avoided as a regular activity except as an exceptional guest lecture.

- **Seminars:**

Objective: To enable a student to study in depth an important area of learning important to the training of the student.

Examples: Examples of potential seminar topics would be Protein Energy Malnutrition, Pediatric Tuberculosis, Pediatric HIV, Bronchial Asthma, Chronic Liver Disease and its complications.

Frequency: Three times a month. Topics to rotate once every 2-3 years (DCh, MD). Topic to be shared among 2-3 students and to be equally distributed depending upon the number of postgraduate students in the department. Ideally, MD students should be given more conceptual topics needing a higher degree of understanding and in depth study. Seniors should have also a more difficult part of the topic when presented as a two-person seminar. Juniors can present after a preliminary month of observation of seminar and ideally could be in combination with senior postgraduates.

- **Journal Club:**

Objective: To appreciate and enable the critical analysis of scientific literature published in peer reviewed journals – studies, reviews.

Examples: Articles like the study on prophylactic Zidovudine to HIV positive pregnant women in prevention of vertical transmission to the fetus, Digoxin versus Captopril in VSD in CCF, etc.

Frequency: Ideally, once in 1-2 months. MDs get the first opportunity and juniors begin after their first year in the course.

- **Bedside Clinics**

Objective: To learn bedside techniques - interview, physical examination, analysis, diagnostic decision making, investigation decisions, treatment and communication.

Examples: Child with hemiplegia, hepatosplenomegaly, anemia, jaundice, etc.

Frequency: Once in a week is the minimum as it forms the basis of good clinical training activities.

- **Mortality Review Meeting**

Objective: To analyze, discuss and learn from mortalities.

Methodology: Once a month, all mortalities in the concerned department are presented to the department, both faculty and residents, and pre-chosen cases are presented in detail. These cases are discussed further and after analysis, shortcomings in diagnosis and treatment are identified to prevent future similar mortalities.

Examples: Snake bite mortalities due to inadequate antivenom, failure to recognize early-compensated circulatory failure or inadequate treatment of hyperkalemia.

Frequency: Once in a month preferably in the first week to allow the previous months mortality to be presented for discussion.

- **Grand Rounds**

Objective: To improve on bedside techniques – interview, physical examination, analysis, diagnostic decision making, investigation decisions, treatment, communication.

Examples: The child with pyrexia of unknown origin, undiagnosed hepatosplenomegaly, multi-systemic disease.

Frequency: Once in a week presuming the Head of Unit or Department does not daily interfere with the day to day management of the ward except in special circumstances.

- **Inter-departmental Meetings**

Objective: To experience inter-departmental cooperation and develop a healthy professional respect for each others opinions in addition to the subject learning experience.

Methodology: Case discussions or students present investigations to members of both faculty. The discussion is a learning experience and improves communications between departments.

Examples: Chest X-rays of a complicated bronchopneumonia progressing to an empyema, CT scans of intra-cranial pathology, Tracheo-esophageal fistulae and supportive care.

Frequency: Once or twice in a month and rotated between departments – Radiology, Pediatric Surgery, Cardiology, Nephrology, Neurology, Clinical Hematology, etc.

- **Clinical Pathological Conference CPC**

Objective: To analyze clinical material to reach a differential diagnosis and correlate with the pathological biopsy findings.

Frequency: Once in two months. First choice is a senior MD student. All are encouraged to participate.

- **Records Round**

Objective: To appreciate the importance of documentation of facts and record keeping.

Methodology: Faculty in the presence of the team scrutinizes random case records. History sheets, doctor order sheets, progress sheets and discharge summaries are discussed.

Frequency: Once a week with the entire team present at the session.

Rotation Postings

Core

Pediatrics	--	13 - 17 months
Neonatology	--	3 - 5 months
Intensive Care/Emergency	--	1 - 2 months

Optional Specialities (optional subject to availability) -- 4 months

Oncology
Neurology
Pediatric Surgery
Nephrology
Cardiology
Clinical Hematology
Dermatology
Pulmonology
Gastroenterology
Clinical Microbiology
Community/Rural

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include: (i) Personal Attitudes, (ii) Acquisition of Knowledge, and (iii) Clinical and operative skills.

i) **Personal Attitudes.** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trustworthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) **Acquisition of Knowledge :** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the

activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Periodic tests:*

The departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book-* Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as

journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records:* Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Annexure I. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

a) Theory

There shall be three question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I : - Emergency/Critical Pediatrics
- Newborn

Paper II : **General Pediatrics I**
-Respiratory, CNS, Hematology, Endocrine
-Gastroenteology, Heaptology, Renal, CVS,
Oncology, Collagen Vascular

Paper III	:	General Pediatrics II
		-Infections
		-Miscellaneous (Ped Surg, Psych, ENT, Ophthal, Metabolic, Immunology, etc.)
		-Ambulatory (OPD) Pediatrics, Community/Social Pediatrics including Nutrition, Immunization

Note: The distribution of chapters / topics shown against the papers are suggestive only.

b) Clinical Examination		150 marks
	No. of Cases	Marks
Long case	1	60
Short Case	1	30
OPD case	1	20
Emergency case	1	20
Newborn	1	20
Total	5	150

c) Viva – voice: 50 Marks

All examiners will conduct viva-voice conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, Histo pathology slides, X-rays, ultrasound, CT scan images, etc., for interpretation. Questions on use of instruments may be asked.

d)				
Maximum marks for	Theory	Practical	Viva	Grand Total
DCH	300	150	50	500

Recommended Books and Journals

Textbooks:

Essential

1. Nelson's Textbook of Pediatrics, Harcourt Asia Saunders
2. Cloherty's Manual of Neonatal Care
3. Meharban Singh's Care of the Newborn
4. Harriat Lane
5. Manual of Pediatric Therapeutics, Little Brown's Children's Hospital, Boston.
6. O.P. Ghai's Textbook of Pediatrics

Reference

1. Rudolf's Pediatrics, Appelton and Lange
2. Forfar and Arneil's Textbook of Pediatrics, ELBS
3. Frank Oski's Principles and Practice of Pediatrics
4. Avery's Disease of the Newborn
5. Roberton's Textbook of Neonatology
6. Illingworth's The normal child
7. Guha's Textbook of Neonatology
8. IAP Textbook of Pediatrics
9. Nadas' Pediatric Cardiology
10. Perloff's Approach to Congenital Heart Disease
11. Moss and Adam's Heart Disease in Infants, children and Adolescent
12. Miller's Blood Diseases of Infancy and Childhood
13. DeGruchy's Clinical Hematology in Medical Practice
14. Barret and Holiday's Pediatric Nephrology
15. Caffey's Pediatric X-Ray diagnosis
16. Alleyne's Protein Energy Malnutrition
17. Miller, Tuberculosis
18. Vimlesh Seth, Tuberculosis
19. Swanson's Pediatric Surgery
20. Cherry and Feigen's Pediatric Infectious Diseases
21. Fenichel's Pediatric Neurology
22. Kendig's Respiratory Diseases in Pediatrics
23. Alex Mowat's Liver Disease in Children
24. Roger's Pediatric Critical Care
25. H.P.S. Sachdev's Principles of Pediatric and Neonatology Emergencies
26. Smith's Recognition patterns of Human Malformations

Indexed Journals

1. Indian Pediatrics
2. Indian Journal of Pediatrics
3. Pediatric Clinics of North America
4. New England Journal of Medicine
5. Lancet
6. British Medical Journal
7. Journal of Pediatrics

8. Archives Disease of Childhood and Adolescence
9. Pediatrics
10. Perinatal Clinics of North America

Reference Series

1. Suraj Gupta's Recent Advances in Pediatrics
2. David's Recent Advances in Pediatrics
3. Advances in Pediatrics
4. Year Book of Pediatrics

ANNEXURE I

Suggested format for Internal Postgraduate evaluation

Name Academics Service Skills Responsibility

Name	Teaching Programs	Discussion	Patient work up	Patient Care	Procedures	Communication	Discipline	Punctuality	Anecdotal events +/-

Pediatric Postgraduate Training Log book

Contents:**1. Personal Data:**

Name
 Institution
 Dates of Postgraduation studies
 Joining
 Completion
 University
 Name and Designation of Guide
 Signature of candidate
 Signature of Supervisor
 Signature of Head of Department

2. Professional Education: (eg. MBBS, DCh)

Degree	Institution	University	Dates of Training

3. Professional Experiences: (eg. SHO Pediatrics, CMO, Tutor)

Professional Post	Institution	Dates of Work period

4. Clinical Postings: (eg. General Pediatrics, PICU, NICU, Oncology, Neurology)

Speciality	Duration	Dates of Posting

5. Case Presentations: (eg. Clinics, tutorials)

Date	Name/age/sex	Problem/ Diagnosis	Grade	Supervisor

6. Seminars: (eg. Seminar on TB)

Date	Topic Presentation	of	Grade	Supervisor

7. Mortality Meetings (eg. Mortality case discussion)

Date	Name/age/sex	Problem/ Diagnosis	Supervisor

8. Multi-disciplinary Meetings (eg. Urinary Lithiasis with Urology and Nephrology)

Date	Topic	Departments involved

9. Community Activity: (eg. Pulse polio, Education programs, Rural visits, Slum visits)

Date	Description of Activity	Supervisor

10. Paper Presentation (Local, State, National, International Forum- eg. IAP local meetings, NNF meetings)

Date	Title of Paper presented	Supervisor

11. Undergraduate Classes taken by MD candidate (eg. Didactic lecture or clinic)

Date	Topic	Supervisor

12. Academic Meetings, CMEs and Conferences attended (*Extra mural: Local, State, National, International Forum- eg. IAP local meetings, NNF meetings*)

Date	Title	Organization

13. Training Courses (*eg. BFHI Lactation course, PALS, NALS, Research Methodology*)

Date	Title	Supervisor

Chapter III

Post Graduate Courses in Psychiatry

M.D. Psychiatry

Goal

The candidates are expected to attain a high degree of proficiency both in the theoretical and practical aspects of psychiatry and related disciplines.

The goals of postgraduate training course would be to train a MBBS doctor who will:

Practice efficiently and effectively the speciality, backed by scientific knowledge and skill base. Exercise empathy and a caring attitude and maintain high ethical standards. Continue to evince keen interest in continuing education in the speciality irrespective of whether he is in a teaching institution or is a practicing psychiatrist. Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common psychiatric problems including emergencies, in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the management of the case and to carry out this management effectively.
- Update himself by self study and by attending courses, conferences and seminars relevant to the speciality.
- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Conduct interviews both in adults and children and of uncooperative patients.
- Perform mental state examination including that of uncooperative patients.
- Document psychiatric history, family history and mental state examination.
- Assess personality including administration and interpretation of projective tests. Administer and interpret tests of Intelligence and Neuropsychological functions.
- Perform common therapeutic procedures .
- Provide basic life saving support services (BLS) in emergency situations

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

Knowledge

A candidate pursuing a course in MD (Psychiatry) is expected to possess adequate knowledge in the following areas:

Clinical features, aetiopathogenesis and treatment of various adult psychiatric disorders including personality disorders, substance abuse disorders, sexual disorders and sleep disorders.

Clinical features, aetiopathogenesis and treatment of common childhood and adolescent psychiatric disorders including issues of special relevance to that age group.

Clinical and treatment issues related to Geriatric psychiatry

Classificatory systems in psychiatry, especially, International Classification of Diseases (ICD) and Diagnostic and Statistical Manual (DSM)

Consultation – Liaison psychiatry, Identification and management of psychiatric emergencies

Community psychiatry: The student should be familiar with various issues and principles underlying community psychiatry, epidemiology of psychiatric disorders with special relevance to India and different models of mental health delivery care systems. It is also essential that a student understands issues pertaining to the field of preventive psychiatry (Primary, secondary and tertiary prevention).

Psychiatric complications of medical illnesses including identification and treatment of various organic psychiatric disorders such as delirium, dementias and amnestic syndromes.

Various methods of therapeutic intervention including drug therapy, electroconvulsive therapy, psychotherapy (individual, marital, family and group therapy) and behaviour therapy, Principles and methods of treatment applied to rehabilitation of psychiatrically ill individuals. Students should be familiar with terms such as impairment, disability and handicap.

Various laws pertaining to the rights, treatment and care of individuals with psychiatric disorders such as Mental Health Act, Disability Act etc;

Medical ethics in general and special ethical concerns as it applies to the practice of clinical psychiatry

Various theories of adult personality, learning theories, issues pertaining to intelligence and its measurement, psychological theories of emotion, motivational aspects of behaviour, thinking, memory and developmental psychology

Principles and interpretation of psychological tests (Adults, children) such as projective tests, tests of intelligence, tests of cognitive and neuro psychological functions.

Common instruments used in the diagnostic assessment and measurement of change in clinical status of various psychiatric disorders.

Basic sciences as applicable to psychiatry such as Neurophysiology, neuroanatomy, neurochemistry, Genetics, Chronopsychobiology, General

psychology, social psychology (Attitudes and its measurement, language and communication, culture, group dynamics, theories of attribution), anthropology and ethology.

Students should be familiar with theoretical aspects of various neuroimaging techniques such as CT scan, PET Scan, MRI etc., It is necessary that student should be able to interpret CT scan of the brain. Similarly, familiarity with various electrophysiological techniques such as EEG and evoked potentials is desirable, with a practical knowledge of EEG being necessary.

Principles of research Methodology: types of experimental designs, setting up a hypothesis, basic techniques, ethical issues with special emphasis on informed consent and patient confidentiality. Students must also be familiar with issues related to choosing a topic of dissertation / research, library work including collecting references and reviewing relevant literature.

Skills

A student must acquire practical skills in:

1. Interview techniques – both adults and children and of uncooperative patients
2. Mental state examination including that of uncooperative patients.
3. Documentation of psychiatric history, family history and mental state examination
4. Assessment of personality including administration and interpretation of projective tests. Administration and interpretation of tests of Intelligence and Neuropsychological functions.

Attitudes and communication abilities

Students must learn to work with a multidisciplinary team including other mental health professionals. It is also essential that students learn to communicate effectively with physicians, other specialists and other health care agencies.

Teaching / Learning activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. *Lectures* : Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.
 - a) *Didactic Lectures*: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:
 - 1) Bio-statistics
 - 2) Use of library,
 - 3) Research Methods
 - 4) Medical code of Conduct and Medical Ethics
 - 5) National Health and Disease Control Programmes
 - 6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.
 - b) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.
2. *Journal Club* : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A time table with names of the student and the moderator should be announced at the beginning of every year.
3. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.
4. *Student Symposium*: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.
5. *Ward Rounds*: Ward rounds may be service or teaching rounds.
 - a) *Service Rounds*: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.

- b) *Teaching Rounds* : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.
- c) A minimum of 40 Clinical cases must be seen every year and a minimum of 10 cases be taken up for Psycho therapy each year.

Entries of (a), (b) and (c) should be made in the Log book.

6. *Clinico-Pathological Conference*: Recommended at least once in three months for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

7. *Inter Departmental Meetings*: Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of the department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histo-chemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

8. *Teaching Skills* : Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. (See model checklist in Chapter IV). Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.

9. *Continuing Medical Education Programmes (CME)* : Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.

10. *Conferences*: Attending conferences is optional. However it is encouraged.

Dissertation

1. Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
2. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
3. Every candidate shall submit to the Registrar (Academic) of RGUHS in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
4. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.
5. The dissertation should be written under the following headings:
 - i. Introduction
 - ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion
 - vii. Conclusion
 - viii. Summary
 - ix. References (Vancouver style)
 - x. Tables
 - xi. Annexures
6. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

7. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.
8. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
9. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Graded responsibility in care of patients

1st Year

Interview techniques, mental state examination, diagnostic summary, diagnostic formulation, supervised inpatient and outpatient work, Supervised administration of ECT, administration and interpretation of Psychological tests (projective tests, tests of intelligence, Neuropsychological tests)

2nd Year

Supervised consultation and liaison work with other departments, evaluation and treatment of psychiatric emergencies under supervision, supervised long term follow up of inpatients discharged to the community, individual psychotherapy of a minimum of one case under supervision, exposure to group therapy family therapy. Student to learn certain behaviour therapy techniques such as relaxation, systematic desensitisation, exposure and response prevention. Assessment and evaluation of children with psychiatric problems. Postings in the Department of Neurology (3 months) and in a psychiatric institution for exposure to Forensic Psychiatry (15 days).

3rd Year

Supervised teaching of clinical psychiatry to undergraduate Medical students, Psychiatry nursing students etc.,

Independent care of long term stable patients in the community and outpatient.

Learning to liaise with agencies outside the hospital setting for community care of patients and if possible to work in a centre dealing with rehabilitation of chronic psychiatrically ill patients (15 days)

Presentation of dissertation work to the faculty of the department In-patient and out-patient work under supervision.

Rotation and Posting in other departments

Allied Subjects:

- Department of Neurology (3 months duration)
- Department of Medicine - Consultation - Liaison Psychiatry (1 month)
- Forensic psychiatry – 15 days
- Department of clinical psychology (where a separate department exists) or supervised clinical work under a clinical psychologist- 1 month duration.
- Child Psychiatry - 3 months

Training in Teaching skills and Research methodology

Research methodology – in the form of didactic lectures and interactive seminars with both clinician and statistician. Selection of a dissertation topic, library work Involving review of relevant literature, writing up a protocol and setting up a hypothesis, Basic statistical techniques (5-6 hrs during the 1st year of training) Learning to critically evaluate research articles (2nd and 3rd year) Published in various scientific journals.

Teaching Skills

Training in teaching skills including learning to use audiovisual aids, supervised teaching of undergraduate medical students and nursing students in clinical psychiatry in the 3rd year of training.

Orientation Programme

Orientation programme regarding use of library, laboratory and hospital procedures, regulations concerning hospital admission and discharges during the first two months of clinical posting.

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills* : Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) *Dissertation in the Department* : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book*- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available, to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

i) Theory

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I: NeuroAnatomy, Neurophysiology, Neurochemistry, Genetics, General and Abnormal Psychology, Social psychology, Anthropology, Ethology and statistics

Paper II: History of psychiatry, Classificatory systems in Psychiatry, Adult psychiatric disorders including personality disorder substance related disorders, sexual disorders, eating disorders, sleep disorders (Epidemiology aetiopathogenesis, clinical features, treatment course and outcome). Psychosomatic disorders, Consultation – Liaison psychiatry, Geriatric psychiatry, Psychiatric emergencies, Psycho-oncology Psychoneuroimmunology, Psychoneuroendocrinology, chronopsychobiology, electrophysiological procedures and brain imaging in psychiatry.

Paper III:

Child and adolescent psychiatric disorders including mental retardation (Epidemiology aetiopathogenesis, clinical features, treatment course and outcome). Mental health issues in women including post-partum psychiatric disorders,

Measurements in Psychiatry, Psychopharmacology, Electroconvulsive therapy, Psychosurgery, Psychotherapy, Rehabilitation in Psychiatry, Forensic Psychiatry, Cultural Psychiatry, Community Psychiatry and Ethics in Psychiatry.

Paper IV: Neurology and Medicine related to Psychiatry

Note: The distribution of chapters / topics shown against the papers are suggestive only.

ii) Clinical Examination

Marks :200

Board of examination: The board of examiners consists of four members.
Out of four one should be a Neurologist / Clinical Psychologist

Aim of the clinical examination is to elicit the knowledge and competency of the candidate for undertaking independent work as specialist / teacher

Long cases – Two: Psychiatry – One – 75
Neurology – One – 75

Short cases – Two : Psychiatry – Two – 50 (2 x25)

iii) Viva voce

100 marks

1) Viva-voice Examination:

(80 marks)

All examiners will conduct viva-voice conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, Histo pathology slides, X-rays, ultrasound, CT scan images, etc., for interpretation. Questions on use of instruments will be asked. It includes discussion on dissertation also.

2) Pedagogy Exercise:

(20 marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

Maximum marks for	Theory	Practical	Viva	Grand Total
M.D. Psychiatry	400	200	100	700

Recommended Books and Journals

1. SADOCK (B J) and SADOCK (V A) Comprehensive Text books of Psychiatry Set of 2 vols. Ed. 7 Baltimore, William & Wilkins, 1995
2. KAPLAN (H I) and SADOCK (B J) Synopsis of text book of Psychiatry, Ed 8, New Delhi, Waverly Pvt Ltd.

3. KENDELL (R E) and Zealley (A K) Ed Companion to psychiatric studies, Ed. 4
Edinburgh, Churchill Living Stone 1998
4. GELDER M etal, Oxford textbook of Psychiatry, Ed.3, Oxford, OUP, 1996
6. CASSEM(NH) , Massachusetts General hospital. Handbook of General Hospital
Psychiatry,
St. Louis, Mosby, 1997
7. LISHMAN (W A), Organic Psychiatry: Consequences of Cerebral Disorder, ED3,
Oxford, Blackwell , Sciences, 1997
8. BARKER (Philip), Basic Child Psychiatry, Ed. 5., London, Blackwell Sciences,
1988
9. KENDEL (Eric R) etal, Priniciples of Neural Science, Ed. 3 Prentice Hall Intl. 1991
10. HARDMAN (Joel F) etal, Goodman and Gilmans The Pharmacological Basis of
Therapeutics, Ed. 9, New York, McGraw Hill, Ed.9
11. MUNN (Norman L), Introduction to Psychology, Ed.3, Oxford and I B H Pub. 1972
12. Fish's Textbook of Psychopathology
13. KUPPASWAMY (B) , An Introduction to Social Psychology, Asia Publishing
House
14. HURLOCK (Elizabeth B), Developmental psychology, Tata McGraw Hill
15. JAMES C COLEMAN, Abnormal Psychology and Modern Life, , D B
TARAPOREWALA Sons and Co Pvt Ltd.
16. CHUSID (J G),Correlative Neuroanatomy and Functional Neurology, 18th edition,
1989, Lange Medical Publication

Journals

1. Indian Journal of Psychiatry
2. Indian Journal of Medical Research
3. American Journal of Psychiatry
4. Archives of general Psychiatry
5. British journal of Psychiatry
6. Psychiatric clinics of North America
7. Neurology (India)
8. Lancet
9. New England Journal of Medicine
10. Indian Journal of Clinical psychology
11. NIMHANS Journal
12. Acta Psychiatrica Scandinavia
13. Psychological Medicine
14. Journal of Clinical Psychiatry
15. Indian Journal of Psychological Medicine

Diploma in Psychiatry (DPM)

Goal

The candidates are expected to attain a high degree of proficiency both in the theoretical and practical aspects of psychiatry and related disciplines.

The goals of postgraduate training course would be to train a MBBS doctor who will:

Practice efficiently and effectively the speciality, backed by scientific knowledge and skill base. Exercise empathy and a caring attitude and maintain high ethical standards. Continue to evince keen interest in continuing education in the speciality. Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. Human values, Ethical practice and Communication abilities

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common psychiatric problems including emergencies, in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the management of the case and to carry out this management effectively.
- Update himself by self study and by attending courses, conferences and seminars relevant to the speciality
- Undertake audit, use information technology tools and participate in clinical research, with the aim of and presenting or publishing his/her work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.

- Conduct interviews both in adults and children and of uncooperative patients.
- Perform mental state examination including that of uncooperative patients.
- Document psychiatric history, family history and mental state examination.
- Assess personality including administration and interpretation of projective tests. Administer and interpret tests of Intelligence and Neuropsychological functions.
- Perform common therapeutic procedures .
- Provide basic life saving support services (BLS) in emergency situations

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

Knowledge

A candidate pursuing a course in Diploma in Psychiatry is expected to possess optimal knowledge in the following areas:

Clinical features, aetiopathogenesis and treatment of various adult psychiatric disorders including personality disorders, substance abuse disorders, sexual disorders and sleep disorders.

Clinical features, aetiopathogenesis and treatment of common childhood and adolescent psychiatric disorders including issues of special relevance to that age group.

Clinical and treatment issues related to Geriatric psychiatry

Classificatory systems in psychiatry, especially, International Classification of Diseases (ICD) and Diagnostic and Statistical Manual (DSM)

Consultation – Liaison psychiatry, Identification and management of psychiatric emergencies

Community psychiatry: The student should be familiar with various issues and principles underlying community psychiatry, epidemiology of psychiatric disorders with special relevance to India and different models of mental health delivery care systems. It is also essential that a student understands issues pertaining to the field of preventive psychiatry (Primary, secondary and tertiary prevention).

Psychiatric complications of medical illnesses including identification and treatment of various organic psychiatric disorders such as delirium, dementias and amnestic syndromes.

Various methods of therapeutic intervention including drug therapy, electroconvulsive therapy, psychotherapy (individual, marital, family and group therapy) and behaviour therapy, Principles and methods of treatment applied to rehabilitation of psychiatrically ill individuals. Students should be familiar with terms such as impairment, disability, and handicap.

Various laws pertaining to the rights, treatment and care of individuals with psychiatric disorders such as Mental Health Act, Disability Act etc;

Medical ethics in general and special ethical concerns as it applies to the practice of clinical psychiatry

Various theories of adult personality, learning theories, issues pertaining to intelligence and its measurement, psychological theories of emotion, motivational aspects of behaviour, thinking, memory and developmental psychology

Principles and interpretation of psychological tests (Adults, children) such as projective tests, tests of intelligence, tests of cognitive and neuro psychological functions.

Common instruments used in the diagnostic assessment and measurement of change in clinical status of various psychiatric disorders.

Basic sciences as applicable to psychiatry such as Neurophysiology, neuroanatomy, neurochemistry, Genetics, Chronopsychobiology, General psychology, social psychology (Attitudes and its measurement, language and communication, culture, group dynamics, theories of attribution), anthropology and ethology.

Students should be familiar with theoretical aspects of various neuroimaging techniques such as CT scan, PET Scan, MRI etc., It is desirable that student should be able to interpret CT scan of the brain. Similarly, familiarity with various electrophysiological techniques such as EEG and evoked potentials is desirable, with a practical knowledge of EEG being necessary.

Awareness of principles of research methodology and library work including collecting references and reviewing relevant literature is desirable.

Skill

A student must acquire practical skills in:

1. Interview techniques – both adults and children and of uncooperative patients
2. Mental state examination including that of uncooperative patients.
3. Documentation of psychiatric history, family history and mental state examination

Attitudes and communication abilities

Students must learn to work with a multidisciplinary team including other mental health professionals. It is also essential that students learn to communicate effectively with physicians, other specialists and other health care agencies.

Teaching / Learning activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills is given below. Lectures: Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated

- a) Didactic Lectures: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:
 - 1) Bio-statistics
 - 2) Use of library
 - 3) Medical code of Conduct and Medical Ethics

- 4) National Health and Disease Control Programmes with special reference to National Mental Health Programme.
- 5) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

- b) Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, eg. basic sciences, psychology, sociology and allied sciences.

1. *Journal Club*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least three times a year and a total of 6 seminar presentations in two years. The presentations would be evaluated using check lists and would carry weightage for internal assessment. (See Checklist in Chapter IV). A time table with names of the student and the moderator should be announced in advance.
2. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics as least three times a year and a total of 6 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be announced in advance.
3. Out patient clinics and follow up work.
4. Ward Rounds: Ward rounds may be service or teaching rounds.
 - a) Service Rounds: Postgraduate should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) Teaching Rounds: Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.
 - c) A minimum of 40 Clinical cases must be seen every year and a minimum of 10 cases be taken up for Psycho therapy each year.

Entries of (a), (b) and (c) should be made in the Log book.

5. *Clinico-Case Conferences*: Candidates should periodically present cases, which will be assessed using check lists (See model checklist in Chapter IV).
 6. *Inter Departmental Meetings*: Strongly recommended particularly with departments of pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.
- Radio-diagnosis*: Interesting cases and the imaging modalities should be discussed.
9. Continuing Medical Education Programmes (CME) : Recommended that at least one state level CME programmes should be attended by each student in 2 years.
 10. Conferences: Attending conferences is optional. However it is encouraged.

Graded responsibility in care of patients

1st Year

Interview techniques, mental state examination, diagnostic summary, diagnostic formulation, supervised inpatient and outpatient work, Supervised administration of ECT, administration and interpretation of Psychological tests (projective tests, tests of intelligence, Neuropsychological tests)

2nd Year

Supervised consultation and liaison work with other departments, evaluation and treatment of psychiatric emergencies under supervision, supervised long term follow up of inpatients discharged to the community, individual psychotherapy of a minimum of one case under supervision, exposure to group therapy family therapy. Student to learn certain behaviour therapy techniques such as relaxation, systematic desensitisation, exposure and response prevention. Assessment and evaluation of children with psychiatric problems. Postings in the Department of Neurology (2 months) and in a psychiatric institution for exposure to Forensic Psychiatry (15 days).

Independent care of long term stable patients in the community and outpatient.

Learning to liaise with agencies outside the hospital setting for community care of patients and if possible to work in a centre dealing with rehabilitation of chronic psychiatrically ill patients (15 days)

Rotation and Posting in other departments

Allied Subjects:

- Department of Neurology (2 months duration)
- Department of Medicine Consultation -Liaison Psychiatry (1 month)
- Forensic psychiatry – 15 days
- Department of clinical psychology (where a separate department exists) or supervised clinical work under a clinical psychologist- 1 month duration.
- Child Psychiatry - 1 month

Orientation Programme

Orientation programme regarding use of library, laboratory and hospital procedures, regulations concerning hospital admission and discharges during the first two months of clinical posting.

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, and (iii) Clinical and operative skills.

i) **Personal Attitudes.** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) **Acquisition of Knowledge :** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The

number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Periodic tests:*

The departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

- v) **Work diary / Log Book-** Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.
- viii) **Records:** Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

i) Theory

There shall be three question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I: Applied Basic Sciences and Behavioural Sciences, Neuro anatomy, Neurophysiology, Neurochemistry, Genetics, General and Abnormal Psychology, Social psychology, Anthropology, Ethology, Biostatistics, Neurology and General Medicine related to Psychiatry

Paper II:

History of psychiatry, Classificatory systems in Psychiatry, Adult psychiatric disorders including personality disorder substance related disorders, sexual disorders, eating disorders, sleep disorders (Epidemiology aetiopathogenesis, clinical features, treatment course and outcome). Psychosomatic disorders, Consultation – Liaison psychiatry, Geriatric psychiatry, Psychiatric emergencies, Psycho-oncology Psychoneuroimmunology, Psychoneuroendocrinology, chronopsychobiology, electrophysiological procedures and brain imaging in psychiatry.

Paper III:

Child and adolescent psychiatric disorders including mental retardation (Epidemiology aetiopathogenesis, clinical features, treatment course and outcome). Mental health issues in women including post-partum psychiatric disorders, Measurements in Psychiatry, Psychopharmacology, Electroconvulsive therapy, Psychosurgery, Psychotherapy, Rehabilitation in Psychiatry, Forensic Psychiatry, Cultural Psychiatry, Community Psychiatry and Ethics in Psychiatry.

Note: The distribution of chapters / topics shown against the papers are suggestive only.

ii) Clinical Examination

Marks : 150

Board of examination: The board of examiners consists of four members.

Out of four one should be a Neurologist / Clinical Psychologist

Aim of the clinical examination is to elicit the knowledge and competency of the candidate for undertaking independent work as specialist / teacher

Long case – One: Psychiatry – 80 marks

Short cases – Two : Psychiatry – One – 35

Neurology – One – 35

iii) Viva-Voce examination: Marks – 50

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross

specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, etc., for interpretation.

D.

Maximum marks for Diploma course.	Theory	Practical	Viva	Grand Total
	300	150	50	500

Recommended Books and Journals

1. SADOCK (B J) and SADOCK (V A) Comprehensive Text books of Psychiatry Set of 2 vols. Ed. 7 Baltimore, William & Wilkins, 1995
2. KAPLAN (H I) and SADOCK (B J) Synopsis of text book of Psychiatry, Ed 8, New Delhi, Waverly Pvt Ltd.
3. KENDELL (R E) and Zealley (A K) Ed Companion to psychiatric studies, Ed. 4 Edinburgh, Churchill Living Stone 1998
4. GELDER M etal, Oxford textbook of Psychiatry, Ed.3, Oxford, OUP, 1996
5. CASSEM(NH) , Massachusetts General hospital. Handbook of General Hospital Psychiatry,
St. Louis, Mosby, 1997
6. LISHMAN (W A), Organic Psychiatry: Consequences of Cerebral Disorder, ED3, Oxford, Blackwell , Sciences, 1997
7. BARKER (Philip), Basic Child Psychiatry, Ed. 5., London, Blackwell Sciences, 1988
8. KENDEL (Eric R) etal, Priniciples of Neural Science, Ed. 3 Prentice Hall Intl. 1991
9. HARDMAN (Joel F) etal, Goodman and Gilmans The Pharmacological Basis of Therapeutics, Ed. 9, New York, McGraw Hill, Ed.9
10. MUNN (Norman L), Introduction to Psychology, Ed.3, Oxford and I B H Pub. 1972
11. Fish's Textbook of Psychopathology
12. KUPPASWAMY (B) , An Introduction to Social Psychology, Asia Publishing House
13. HURLOCK (Elizabeth B), Developmental psychology, Tata McGraw Hill
14. JAMES C COLEMAN, Abnormal Psychology and Modern Life, , D B TARAPOREWALA Sons and Co Pvt Ltd.
15. CHUSID (J G),Correlative Neuroanatomy and Functional Neurology, 18th edition, 1989, Lange Medical Publication

Journals

1. Indian Journal of Psychiatry.
2. Indian Journal of Medical Research.
3. American Journal of Psychiatry.
4. Archives of general Psychiatry.
5. British journal of Psychiatry.
6. Psychiatric clinics of North America.
7. Neurology (India).
8. Lancet.
9. New England Journal of Medicine.
10. Indian Journal of Clinical psychology.
11. NIMHANS Journal .
12. Acta Psychiatrica Scandinavia.
13. Indian Journal of Psychological Medicine.

Chapter III

Post Graduate Courses in Radio-Diagnosis

M. D. Radio-Diagnosis

Goal

The goal of the course is to orient the students on various aspects of imageology by way of theory and practical training in the diseases of various systems of the human body. They should be able to apply knowledge and skills at secondary and tertiary level of medical care.

The postgraduate training course would be to train a MBBS doctor who will:

- Practice efficiently and effectively the specialty, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education in the specialty irrespective of whether he is in a teaching institution or is a practicing specialist.
- Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion
- Describe common malignancies in the country and their management including prevention
- Demonstrate understanding of basic sciences relevant to this specialty
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.

- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Update oneself by self study and by attending courses, conferences and seminars relevant to the specialty.
- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- Undertake complete patient monitoring including the care of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

- 1) Basic Sciences (Radiation Physics and Radio – Biology), Newer imaging techniques, Radiological Anatomy, Physiology, Pathology and Radiography.

Includes fundamentals in Electricity and Electro magnetic induction, Ammeter, Voltmeter and Galvanometer. Transformers, Rectifiers, Rectification, Timers, x-ray Production and other aspects of x-rays. Electro magnetic

Radiation, Units of Radiation interaction x-ray film intensifying screens and other x-ray appliances, Dark room procedures etc. II TV and cine fluorography, Tomography Radiative Isotopes and uses, instrumentation in Nuclear Medicine, MMR, Radiation production and other aspects of production.

Radiological Anatomy, Physiology and pathology of different system of the body and Radiographic Techniques concerned to each system.

Physics of Ultrasound CT, MRI.

Basics of Radiotherapy and equipments of Radiotherapy.

2) **Respiratory system**

Includes the following methods of investigations and interpretation of Chest films, Chest wall, Diaphragm, Pleural disease and air way disease, Pulmonary vasculature, pulmonary infections, pulmonary neoplasms, diffuse lung disease, Mediastinal disease, Chest Trauma, Post operative lung and intensive care.

3) **Alimentary and Hepatobiliary system; Congenital Anamolies of GI Tract**

Disease and disorders of mouth, Pharynx, Esophagus, stomach small intestine, large intestine, disease of omentum and mesentery acute abdomen, abdominal trauma, newer methods like Isotopes study. T, MRI, Hepatobiliary system. Disease and disorders, newer methods of imaging hepatibilio pancreatic system like, Isotopes study, T Photo Arteriography, sprial CT, MRI.

4) **Head and neck; spinal column and skull**

Includes Radiological dimension and imaging of various diseases and disorders of the above system.

Investigative procedures of congenital lesious, vascular lesions, infective lesions, Metabolic lesions, traumatic lesions and neoplasia of the central nurvous system including CT, MRI.

Disease and disorders of spinal cord lesions including congenital lesions.
Interventional procedures.

5) **Cardiovascular system**

Role of Radiological imaging by different Techniques including DSA and interventional procedures.

Disease and disorders of Cardiovascular system including Congenital conditions and the role of imaging by conventional, Ultrasound, Echo, Doppler, CT, MRI, Angio, DSA and Radio Nuclide studies.

6) Endocrinal system

Imaging of disorders, disease and congenital conditions of endocrinal glands – Pitutary, Adrenal, Thyroid, para thyroid, pancreas.
Newer methods of imaging including embolisation.

7) Genito Urinary system

Imaging – conventional, Ultrasound, CT, MRI of various disease and disorders including congenital conditions of genito Urinary system.

Role of interventional imaging.

8) Musculo Skeletal system

Role of conventional, Ultrasound, Radio Nuclide studies, CT, MRI of disease, disorders and congenital conditions of muscles, soft tissue, bones and joints.

9) Soft Tissue Radiology

Includes various soft tissue disorders and diseases and role of imaging.

10) Interventional Radiology

Includes all procedures like interventional imaging and interventional treatment including follicular study etc.

11) Recent trends and Advances

Includes all information and imaging information that published in National and International Journals and references, vascular Ultrasound, PACS, digital x-ray, CT, MRI and Nuclear Medicine.

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself/herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

- 1. Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) Didactic Lectures: Recommended for selected common topics for postgraduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics.
- 2) Use of library
- 3) Research Methods
- 4) Medical code of Conduct and Medical Ethics.
- 5) National health and Disease Control Programs.
- 6) Communication Skills etc.
- 7) Initial introductory lectures about the subject.

These topics may preferably taken up in the first few weeks of the 1st year.

b) Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, e.g. Jaundice, Diabetes Mellitus, Thyroid etc.

2. Journal Club: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must make a presentation from the allotted journal(s) of selected articles at least four times a year and a total of 12 presentations in three years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable with names of the students and the moderator should be announced at the beginning of every year.

3. Subject seminar: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.

4. Student Symposium: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.

5. Ward Rounds: May be service rounds or teaching rounds.

- a) Service Rounds: Postgraduate students should do ward rounds every day.
 - i) For pre anaesthetic evaluation of the patients posted for operation.
 - ii) And to do the post anaesthetic follow up of operated patients for alleviation of post-operative pain and for diagnosis and management if any of the post-operative sequelae.

- b) Teaching Rounds: Every unit should have grand round for teaching clinical methods and pre anaesthetic evaluation.

Entries of (a) and (b) should be made in the Logbook.

6. **Mortality & Morbidity Meetings**: Recommended once a month for all postgraduate students. Presentation be done by rotation and by the students who had conducted/assisted anaesthetic management.
7. **Inter Departmental Meetings**: Strongly recommended particularly with departments of Surgery, Orthopedics and Medicine at least once a month. These meetings should be attended by postgraduate students and relevant entries must be made in the Logbook.
8. **Teaching skills**: Postgraduate students must teach Undergraduate students (e.g. Medical, Nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by faculty. Record of their participation should be kept in Logbook. Training of postgraduate students in Educational Technology is recommended.
9. **Continuing Medical Education Programmes (CME)**: At least 2 state / national level CME programmes should be attended by each student in 3 years.
10. **Conferences**: Attending conferences is optional. However, participation & presentation of scientific paper should be encouraged.

Rotation Posting

Three months duration

1)	NIMHANS for exposure and interpretation of Brain and spinal cord lesions	- 4 weeks
2)	For cancer radio-diagnosis and Nuclear Medicine in an oncology Department or institute	- 2 weeks
3)	OBG and Pediatric Radio-Diagnosis	- 4 weeks
4)	Cardiology	- 2 weeks
Total		12 weeks

Dissertation

1. Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate

teacher. The results of such a work shall be submitted in the form of a dissertation.

2. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
3. Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
4. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.
5. The dissertation should be written under the following headings:
 - i. Introduction
 - ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion
 - vii. Conclusion
 - viii. Summary
 - ix. References (Vancouver style)
 - x. Tables
 - xi. Annexures
6. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.
7. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.

8. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
9. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) **Clinical skills**

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the logbook. (Table No.3, Chapter IV)

iv) Teaching skills : Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) Dissertation in the Department : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another

before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book*- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The logbook is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the logbook. Collectively, logbooks are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the logbook for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

i) Theory

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100.

Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper – I

- 1) Basic Sciences as applied to Radio-Diagnosis – Radiological Anatomy, Physiology, Pathology, Radiography, Radiation Physics and Biology. Basics of Ultrasound CT, Nuclear Medicine and MRI
- 2) Bones and Joints

Paper – II

Respiratory system; Gastrointestinal system and abdomen (including Pancreas, Adrenals, Biliary tree, Spleen, Liver and acute abdomen)

Paper – III

Cardiovascular system including Lymphatic system, Arteriography Phlebography and Interventional procedures.
Urogenital system including Scrotum and Obstetrics and Gynaecology

Paper – IV

Skull and Central Nervous system; ENT, Eyes, Teeth and soft tissues.

Note: The distribution of chapters / topics shown against the papers are suggestive only.

ii. Clinical

200 marks

- a) Long Case – One – 100 Marks
- b) Short Cases – two – 100 Marks (50 x 2)

iii. Viva-Voce

100 marks

- 1) Viva-voice Examination: (80 marks)
All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents spotters of conventional & newer imaging techniques and instruments. In addition, candidates may be also be given case reports, charts, gross specimens, etc., for interpretation. It includes discussion on dissertation also.
- 2) Pedagogy Exercise: (20 marks)
A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

iv.

Maximum marks for	Theory	Practical	Viva	Grand Total
MD Radio-Diagnosis	400	200	100	700

Recommended Text Books:

- | | | |
|-----|------------------------------------|------------------|
| 1) | Text Book of Radiology and Imaging | -By Sutton |
| 2) | Text book of Diagnostic Radiology | -Grainger |
| 3) | Text books of x-ray Diagnosis | -Shanks & Kerley |
| 4) | Positioning in Radiography | -Clark |
| 5) | Diagnostic Radiology & Imaging | -K Subba Rao |
| 6) | Fundamental Physics of Radiology | -Meredith |
| 7) | Radiographic Anatomy | -Meschan |
| 8) | Diagnostic Ultrasound | -Sarthi |
| 9) | Basic Nuclear Medicine | -Sheldon Baur |
| 10) | Alimentary Tract and Imaging | -Margullis |
| 11) | Essentials of Radiological imaging | -Paul & Juhls |

Reference Books

- | | | |
|-----|---|------------|
| 1) | Diagnostic Radiology CT & MRI of whole body | -By Haaga |
| 2) | Pediatric x-ray diagnostic | -Caffey's |
| 3) | Roentgen's Science in Diagnostic imaging | -Meschan |
| 4) | Seminar in Ultrasound | |
| 5) | Felsons chest Radiology | -Felson |
| 6) | Aids to differential diagnostic | -Chapman |
| 7) | Text book of Neuro imaging | -Osborn |
| 8) | Uro Radiology | -Elkin |
| 9) | Diagnostic Ultrasound | -Cannon |
| 10) | Diagnostic Ultrasound | -Cosgroove |
| 11) | Diagnostic Ultrasound | -Rheumac |
| 12) | Echo | -Phegonbom |
| 12) | H.R.C.T. | |

Journals

- 1) Indian Journal of Radiology and Imaging
- 2) Clinical Radiology
- 3) British Journal of Radiology
- 4) American Journal of Roentgenology
- 5) Radiology clinics in North America
- 6) Recent Advances in Radiology and Imaging
- 7) Text book of Radiology
- 8) Lancet
- 9) Journal of Diagnostic Medical Sonography
- 10) Seminar in Ultrasound
- 11) Clinical Nuclear Medicine
- 12) Journal of Vascular and Interventional Radiology
- 13) Journal of computed assisted Tomography.

Diploma in Radio-Diagnosis (DMRD)

Goal

The goal of the course is to orient the students on various aspects of imageology by way of theory and practical training in the diseases of various systems of the human body. They should be able to apply knowledge and skills at secondary and tertiary level of medical care. The postgraduate training course would be to train a MBBS doctor who will:

- Practice efficiently and effectively the specialty, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education in the speciality.
- Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion
- Describe common malignancies in the country and their management including prevention
- Demonstrate understanding of basic sciences relevant to this speciality
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Update oneself by self study and by attending courses, conferences and seminars relevant to the speciality.

- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- Undertake complete patient monitoring including the care of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

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Includes fundamentals in Electricity and Electro magnetic induction, Ammeter, Voltmeter and Galvanometer. Transformers, Rectifiers, Rectification, Timers, x-ray Production and other aspects of x-rays. Electro magnetic Radiation, Units of Radiation interaction x-ray film intensifying screens and other x-ray appliances, Dark room procedures etc. II TV and cine fluorography, Tomography Radiative Isotopes and uses, instrumentation in Nuclear Medicine, MMR, Radiation production and other aspects of production.

Radiological Anatomy, Physiology and pathology of different system of the body and Radiographic Techniques concerned to each system.

Physics of Ultrasound CT, MRI.

Basics of Radiotherapy and equipments of Radiotherapy.

2) **Respiratory system**

Includes the following methods of investigations and interpretation of Chest films, Chest wall, Diaphragm, Pleural disease and air way disease, Pulmonary vasculature, pulmonary infections, pulmonary neoplasms, diffuse lung disease, Mediastinal disease, Chest Trauma, Post operative lung and intensive care.

3) **Alimentary and Hepatobiliary system; Congenital Anamolies of GI Tract**

Disease and disorders of mouth, Pharynx, Esophagus, stomach small intestine, large intestine, disease of omentum and mesentery acute abdomen, abdominal trauma, newer methods like Isotopes study. T, MRI, Hepatobiliary system. Disease and disorders, newer methods of imaging hepatobilio pancreatic system like, Isotopes study, T Photo Arteriography, sprial CT, MRI.

4) **Head and neck; spinal column and skull**

Includes Radiological dimension and imaging of various disease and disorders of the above system.

Investigative procedures of congenital lesious, vascular lesions, infective lesions, Metabolic lesions, traumatic lesions and neoplasia of the central nurvous system including CT, MRI.

Disease and disorders of spinal cord lesions including congenital lesions.

Interventional procedures.

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Disease and disorders of Cardiovascular system including Congenital conditions and the role of imaging by conventional, Ultrasound, Echo, doppler, CT, MRI, Angio, DSA and Radio Nuclide studies.

6) **Endocrinal system**

Imaging of disorders, disease and congenital conditions of endocrinal glands – pituitary adrenal, Thyroid, para thyroid, pancreas.

Newer methods of imaging including embolisation.

7) **Genito Urinary system**

Imaging – conventional, Ultrasound, CT, MRI of various disease and disorders including congenital conditions of genito Urinary system.

Role of interventional imaging.

8) **Musculo Skeletal system**

Role of conventional, Ultrasound, Radio Nuclide studies, CT, MRI of disease, disorders and congenital conditions of muscles, soft tissue, bones and joints.

9) **Soft Tissue Radiology**

Includes various soft tissue disorders and diseases and role of imaging.

10) **Interventional Radiology**

Includes all procedures like interventional imaging and interventional treatment including follicular study etc.

11) **Recent trends and Advances**

Includes all information and imaging information that published in National and International Journals and references, vascular Ultrasound, PACS, digital x-ray, CT, MRI and Nuclear Medicine.

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- 1) Bio-statistics
- 2) Use of library,
- 3) Medical code of Conduct and Medical Ethics
- 4) National Health and Disease Control Programmes
- 5) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. *Journal Club* : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least three times a year and a total of six seminar presentations in two years. The presentations would be evaluated using check lists and would carry weightage for satisfactory completion of the course (See Checklist in Chapter IV).
3. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least three times a year and a total of six seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for satisfactory completion of the course..
4. *Student Symposium*: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.
5. *Ward Rounds*: Ward rounds may be service or teaching rounds.
 - a) *Service Rounds*: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) *Teaching Rounds* : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries of (a) and (b) should be made in the Log book.

6. *Clinico-Pathological Conference*: Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
7. *Clinical case presentations*: Candidates should periodically present cases, which will be assessed by using check lists (see checklist in Chapter IV)
8. *Inter Departmental Meetings*: Strongly recommended particularly with departments of Medicine, Surgery, Orthopedics, etc., meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

9. *Continuing Medical Education Programmes (CME)* : Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.

10. *Conferences*: Attending conferences is optional. However it is encouraged.

Postgraduate student should maintain dairy of day to day work. They should do all investigation and film reporting under the supervision of the senior teachers.

Rotation Postings

1)	NIMHANS for exposure and interpretation of Brain and spinal cord lesions	- 2 weeks
2)	For cancer radio-diagnosis and Nuclear Medicine in an oncology Department or institute	- 2 weeks
3)	OBG and Pediatric Radio-Diagnosis	- 2 weeks
4)	Cardiology	- 2 weeks
Total		<u>8 weeks</u>

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, and (iii) Clinical and operative skills.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team

- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) ***Clinical skills***

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Periodic tests:*

The departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book-* Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records:* Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

a) Theory

There shall be three question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. All papers consist of conventional radiology and including newer imaging techniques and also recent advances in respective chapters of the paper. Details of distribution of topics for each paper will be as follows:

Paper – I

- 1) Basic Sciences as applied to Radio – Diagnosis – Radiological Anatomy, Physiology, Pathology, Radiography, Radiation Physics and Biology. Basics of Ultrasound CT, Nuclear Medicine and MRI
- 2) Bones and Joints
- 3) Respiratory system

Paper – II

Gastrointestinal system and abdomen (including Pancreas, Adrenals Biliarytree, Spleen, Liver and acute abdomen)

Cardiovascular system including Lymphatic system, Arteriography Phleography and interventional procedures.

Paper – III

Urogenital system including Scrotum and obstetrics and Gynaecology, Skull and Central nervous system. ENT, Eyes, Teeth and soft tissues.

Note: The distribution of chapters / topics shown against the papers are suggestive only.

b) Clinical: 150 marks

- a) Long case – 1 - 100 marks
- b) Short cases – 2 - 50 marks

c) Viva voce : 50 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents spotters of conventional & newer imaging techniques and instruments. In addition candidates may be also be given case reports, charts, gross specimens, etc., for interpretation.

d)

Maximum marks for	Theory	Practical	Viva	Grand Total
Dip. Radio-Diagnosis	300	150	50	500

Recommended Books

- | | | |
|----|------------------------------------|---------------------|
| 1) | Text book of Radiology and Imaging | - Sutton |
| 2) | Text book of Diagnostic Radiology | - Grainger |
| 3) | Diagnostic Ultrasound | - Reheumic |
| 4) | Basic Nuclear Medicine | - Sheldin Baur |
| 5) | Diagnostic Radiology and Imaging | - Dr. Subba rao |
| 6) | Fundamental Physical Radiology | - Maredith & Massed |
| 7) | Radiographic Anatomy | - Meschan |
| 8) | Positioning in Radiography | - Clerk |

Reference Books

- | | | |
|----|--|--------------|
| 1) | Diagnostic Radiology CT and MRI whole body | - John Haaja |
| 2) | Pediatric x-ray Diagnosis | - Caffey |
| 3) | Roentgen Science in Diagnostic Imaging | - Meschan |
| 4) | Felson chest Roentgenology | - Felsun |
| 5) | Aids to differential Diagnosis | - Chapran |
| 6) | Alimentary tract Radiology and Imaging | - Margullis |
| 7) | Seminars in Ultrasound | |

Journals

- 1) Indian Journal of Radiology and Imaging
- 2) American Journal of Radiology
- 3) Journal of Diagnostic Medical Sonography
- 4) Journal of computed assisted Tomography
- 5) Clinical Nuclear Medicine.

Chapter III

M. D. Radio Therapy

Goals:

Radiation Oncology is a clinical and scientific discipline devoted to management of patients with cancer and other disease by ionizing radiation, alone or combined with other modalities like Surgery and Chemotherapy.

At the end of the training program the candidate should have acquired sufficient expertise and in-depth knowledge in the field of Oncology, Basic and Radiological Physics, Radiobiology, Etiology, Pathology, Epidemiology and Statistics related to malignant diseases and the investigations commonly used like Radiology and Laboratory methods, practice of Clinical Oncology with special reference to Radiation Oncology and Chemotherapy, management of Oncologic Emergencies and side effects of Cancer management. The candidate should have good knowledge of Cancer Prevention, early detection, rehabilitation and emotional problems and the recent advances in Oncology. He/she should exercise empathy and a caring attitude and maintain high ethical standards; continue to evince keen interest in continuing education irrespective of whether he/she is in a teaching institution or is a practicing specialist; and be a motivated 'teacher' – defined as a specialist keen to share his / her knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Demonstrate understanding of basic sciences relevant to this speciality
- Describe common malignancies in the country and their management including prevention
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.

- Update oneself by self study and by attending courses, conferences and seminars relevant to the speciality.
- Teach and guide his team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform common procedures relevant to the speciality.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- Undertake complete monitoring of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

A. Radiation Therapy Physics

Principles of Radiological Physics, Dosimetry, and Treatment Planning

Physics and Dosimetry of High & Low Dose-Rate Brachytherapy

General Physics

- I Matter and Energy, Radiation and Spectra,
- II Atoms and Nuclei.

- III Radioactivity.
- Radioactivity – Materials,
- The Production of X-Rays,
- The Interaction of X- And Gamma Rays with Matter-I,
- The Interaction of X- and Gamma Rays with Matter-II,
- The Effects of X-Rays,
- The Measurement of X-Ray Quantity,
- The Roentgen and ITS Measurement,
- The Geiger-Muller and Scintillation Counters and the Thermoluminescence Dosemeter,
- Absorbed Dose and the Rad,
- Filters and Filtration.

Physics Applied To Radiotherapy

- The Physical Principles of Radiotherapy,
- Teletherapy Dosage Data: General Considerations,
- Teletherapy Dosage data for Clinical Use,
- Out put Measurements and the use of Isodose charts,
- Patients dosage,
- Beam Modification,
- Collimators and Beam-Direction Devices,
- The treatment prescription,
- Some special techniques,
- Teletherapy Sources,
- Acceptance tests and Calibration,
- Gamma-Ray Sources for Plesiotherapy,
- Plesiotherapy Dosage Calculations,
- Particle Radiations in Radiotherapy

Radiation Protection

- General Principles and Materials,
- Departmental Protection,
- Protection Instrument and Personnel Monitoring.

B. Radiation Biology:

1. The Physics and Chemistry of Radiation Absorption
2. DNA Strand Breaks and Chromosomal Aberrations
3. Cell Survival Curves
4. Dose-Response Relationships for Normal Tissues
5. Model Tumor Systems
6. Radiosensitivity and Cell age in the Mitotic cycle
7. Repair of Radiation damage and the Dose-Rate Effect.
8. The oxygen Effect and Reoxygenation.

9. Linear Energy Transfer and Relative Biological Effectiveness.
10. Radiosensitizers and Bio-reductive Drugs.
11. Radioprotectors.
12. Cell, Tissue, and Tumor kinetics.
13. Time, Dos and Fractionation in Radiotherapy
14. New Radiation Modalities.
15. Predictive Assays.
16. Hyperthermia
17. Chemotherapeutic agents from the perspective of the Radiation Biologist.
18. Acute Effects of Total-Body Irradiation
19. Radiation Carcinogenesis.
20. Hereditary Effects of Radiation.
21. Effects of Radiation on the Embryo and Fetus.
22. Radiation Cataractogenesis.
23. Molecular Techniques in Radiobiology
24. Diagnostic Radiology and Nuclear Medicine.
25. Radiation Protection.

C. Basic Sciences

1. Pathology of Benign and Malignant Diseases
 - A. Principles and methods of definite diagnosis, Surgical biopsy, Exfoliative Cytology, Fine needles aspiration cytology and biopsy
 - B. General histologic and cytologic features and malignancy
 - C. Classification of benign and malignant tumors and their interpretation.
 - D. Methods of dissemination of cancer and its biological behaviors.
 - E. Degree of differentiation of cancer.
 - F. Radiation pathology.
2. Applied Anatomy and Physiology.
 - A. Anatomy of oral cavity, larynx, pharynx, paranasal sinuses, CSF pathways, salivary glands, middle ear, external orbit, breast, bronchopulmonary segments, mediastinum, oesophagus, liver, spleen, small and large bowels, pelvic and genito-urinary organs (bladder, uterus, ovary, testis, rectum, anal canal etc).
 - B. Lymphatic system and drainage,
 - C. Relationship of vital structures,
 - D. General principles of physiology of respiratory, cardiovascular, nervous and biliary systems.
3. Various investigative and imaging Procedures in Diagnosis, Staging, Management and Follow-up of cancer.

D. Bio-statistics

1. Sampling – Random sampling, purposive sampling, advantages of sampling, Various methods of sampling (Simple random, systematic, stratified, cluster, Multistage & multiphase), sampling error, non-sampling error.
2. Descriptive statistics – Arithmetic mean, Median, Mode, and Standard error, coefficient of variation.
3. Graphics presentation of data – Bar diagram, histogram frequency curve, line graph, pie chart.
4. Normal distribution – Definition and properties/Confidence interval, Basic concept of testing of hypothesis, p-value, power of the test.
5. Test of significance –t-test, test of proportion, chi-square test, concept of analysis of variance.
6. Study design – Descriptive studies, analytical studies. Observational studies, experimental studies, prospective studies, retrospective studies, odds ratio, relative risk, attributable risk percent, population attributable risk percent.
7. Correlation and regression – Simple correlation, linear regression, concept of multiple regression.
8. Survival analysis – Life table, Survival analysis, K – M Method, Cox regression, log rank test.
9. Sample size determination – Basic concept, sample size determination of estimating proportion and mean.
10. Clinical trials in cancer research – Basic concept.

E. Principles of Oncology

1. Molecular Biology of cancer: oncogene, Cytogenetics, The Cell Cycle, Invasion and Metastasis
2. Etiology of Cancer: Viruses, Chemical Factors, Physical Factors, Hormonal Factors
3. Epidemiology of Cancer:
4. Principles of Cancer Management: Molecular pathology, cancer Genetics,
5. Principles of Surgical Oncology
6. Principles of Chemotherapy

7. Principle of Biology Therapy,
8. Cancer Drug Discovery and Development, Mechanisms of Drug Resistance,
9. Clinical Trails in Cancer
10. Cancer Prevention: Preventing Tobacco – Related Cancers, Diet and Risk Reduction, Chemopreventive Agents, Hormones,
11. Cancer Screening,
12. Imaging Techniques in Cancer Management: Computer Tomography, Magnetic Resonance Imaging, Radionuclide Imaging, Ultrasound, Functional and Metabolic Imaging, Interventional Radiology, Endoscopy, Laparoscopy,
13. Vascular Access and Specialized Techniques of Drug Delivery
14. Paraneoplastic Syndromes

F. Principles of Radiation Oncology

1. Biologic Basis of Radiation therapy
2. Altered Fractionation Schedules
3. Morphology of Radiation Effects on Normal Tissues
4. Late Effects of Cancer Treatment: Radiation and Drug Toxicity
5. Staging and Classification of the Cancer and the Host: A unified Approach versus Methodology of Clinical Trials
6. Chemical Modifiers of Radiation, Chemotherapy and Irradiation
7. Clinical Applications of Electron Beam Therapy
8. Total Body and Hemibody Irradiation
9. Three-Dimensional Conformal Radiation Therapy: Clinical Aspects
10. Particle Beam Radiation Therapy: Clinical Applications
11. Radioimmunoglobulins in Cancer Therapy

Radiotherapy – External/Brachytherapy: Indication, Rationale, Preparation of the patient techniques, dose, volume, times, fractionation, Simulations, reduplication of treatment, Procedure, results, response, survival, complication, management of Radiotherapy complication follow-up and summary.

G. Principles and Practice of Radiotherapy and Oncology

GROUP A:

Skin, Classic and Acquired Immunodeficiency Syndrome (AIDS)-Related Kaposi's Sarcoma, Cutaneous T-Cell Lymphoma, Brain, Pituitary, Spinal Canal, Eye, Ear, Nasopharynx, Nasal Cavity and Paranasal Sinuses, Salivary Glands, Oral Cavity, Tonsillar Fossa and Faucial Arch, Base of Tongue, Hypopharynx, Larynx, Unusual Nonepithelial Tumors of the Head and Neck, Head and Neck: Management of the Neck

GROUP B:

Thyroid. Lung, Mediastinum and Trachea, Esophagus, Heart and Blood Vessels, Breast: Stage Tis, T1 and T2 Tumors, Breast: Locally Advanced (T3 and T4) and

Recurrent Tumors, Pancreas and Hepatobiliary Tract, Colon and Rectum, Anal Canal, Kidney, Renal Pelvis, and Ureter, Bladder, Female Urethra, Prostate, Testis, Penis and Male Urethra,

GROUP C:

Uterine Cervix, Endometrium, Ovary, Fallopian Tube, Vagina, Vulva, Retroperitoneum, Adrenal Gland, Hodgkin's Disease, Non-Hodgkin's Lymphomas, Multiple Myeloma and Plasmacytomas, leukemias, Bone, Soft Tissue Sarcomas (Excluding Retroperitoneum, Pediatric Tumors: An Overview, Brain Tumors in Children, Wilms' Tumor, Neuroblastoma, Rhabdomyosarcoma, Lymphomas in Children, Radiation Treatment of Benign Disease, Pain Management, Supportive Care and quality of life in Radiation Oncology

GROUP D:

Oncologic Emergencies: Superior Vena Cava Syndrome, Spinal Cord Compression, Metabolic Emergencies, Surgical Emergencies, Urologic Emergencies,

Treatment of Metastatic Cancer: Brain, Lung, Liver, Bone, Malignant Pleural and Pericardial Effusions, Malignant Ascites

Infections in the Cancer Patients

Adverse Effects of Treatment: Nausea and Vomiting, Oral complications, Cystitis, Pulmonary Toxicity, Cardiac Toxicity, Hair Loss, Gonadal Dysfunction, Second Cancers, Miscellaneous Toxicities,

Supportive Care and Quality of Life:

Management of Cancer Pain, Nutritional Support, Sexual Problems, Genetic Counseling,

Psychologic Issues, Specialized care of the Terminally ill, Approaches to Meeting the Needs of the Dying Patient, Rehabilitation of the Cancer Patient

H. Newer Approaches to Cancer Treatment:

Gene Therapy, Cancer Vaccines, Immunotoxin Therapy, Antisense Inhibition of Gene Expression, Antiangiogenic Therapy, Radiation and Chemotherapy Protectors, Intensity Modulation of the Radiation Beam, Fractionated (Relocatable) Stereotactic Radiotherapy, Molecular Targets for Drug Development.

Quality Assurance, Recent Advances in Radiation Therapy, Altered Fractionation, Biologic Modeling and Plan Evaluation, Conformal Therapy, Proton Therapy, Neutron Brachytherapy, Neutron Capture Therapy, Neutron Beam Therapy, Heavy Ion and Pion Therapy, Physics of High Linear Energy Transfer (LET) Particles and Protons, Intra-operative Radiation Therapy, Hyperthermia, Three-Dimensional Physics and Treatment Planning, Stereotactic Irradiation.

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. *Lectures* : Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) *Didactic Lectures*: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library,
- 3) Research Methods
- 4) Medical code of Conduct and Medical Ethics
- 5) National Health and Disease Control Programmes
- 6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) *Theory Lectures* : By Specialists in pathology, Radiation Physics, Radiobiology, Chemotherapy and Radiation Oncology, Biostatistics.

c) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. *Journal Club* : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist in Chapter IV). A time table with names of the student and the moderator should be announced at the beginning of every year.

3. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The

presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist in Chapter IV). A timetable for the subject with names of the students and the moderator should be scheduled at the beginning of every year.

4. *Student Symposium*: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.
5. *Ward Rounds*: Ward rounds may be service or teaching rounds.
 - a) *Service Rounds*: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) *Teaching Rounds* : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries of (a) and (b) should be made in the Log book.

6. *Clinical Case Presentations*: Minimum of 5 cases to be presented by every candidate each year. They should be assessed using check lists and entries made in the log book
7. *Clinico-Pathological Conference*: Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
8. *Inter Departmental Meetings*: Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of Surgery department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histo-chemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

9. *Teaching Skills* : Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. (See model check list in Chapter IV). Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.
10. *Continuing Medical Education Programmes (CME)* : Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.
11. *Conferences*: Attending conferences is optional. However it is encouraged.

Dissertation

1. Every candidate pursuing degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
2. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
3. Every candidate shall submit to the Registrar (Academic), RGUHS, in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
4. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.
5. The dissertation should be written under the following headings:
 - i. Introduction
 - ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion
 - vii. Conclusion
 - viii. Summary

-
- ix. References (Vancouver style)
 - x. Tables
 - xi. Annexures
6. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.
 7. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.
 8. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
 9. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Graded Responsibility in Care of Patients and Operative work (Structured Training Schedule)

- I Year : Participation in OPD work, Observation in Treatment planning and execution and ward care helping the consultant in in-patient care.
- II Year: Participation in OPD, Treatment planning and execution under supervision of consultant & inpatient care.
- III Year. Independent assessment, execution of treatment decision allowed but cross checked by the consultant before execution. Participation in teaching and research activities and in-patient care.

Rotation Posting

MD Students shall be posted to other relevant departments or other centers with better and latest equipment's for a minimum period of 3 to 6 months, for completion of training in Medical and Surgical Oncology and for learning recent advances in the specialty. The student on completion of the training shall submit a report duly signed by the concerned department to the HOD Radiotherapy.

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) *Personal Attitudes.* The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) *Acquisition of Knowledge :* The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation

skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills* : Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) *Dissertation in the Department* : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *Periodic tests*: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) Work diary / Log Book- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records*: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

Maintenance of Log Book for Academic Activities. All the Programs conducted should be entered in both the student /departmental records and countersigned by respective Teaching Faculty documenting the completion of assigned task.

Record Books of Bed Side clinics, Seminars and Journals presented with copies of the presentation duly corrected and signed by a teacher with comments are to be maintained by the student and submitted to the Head of the Department periodically and at the end of the course.

The Record books maintained by the student should be submitted to the Head of the Department 6 months prior to completion of the course and the Head of the Department makes a certification of the Academic Progress. An assessment of student performance through out the said course shall be made by the HOD and communicated to the University.

The log book is a record of the important activities of the candidates during his training, Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination:**A. Theory (Written Paper) 400 marks**

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows.

Paper I : Applied Anatomy, Pathology, Radiation Physics, Radio biology.

Paper II : Principles and Practice of Chemotherapy in Malignant Diseases, Preventive Oncology, Palliative Care.

Paper III : General Principles of Radiotherapy and Oncology. Principles and Practice of Radiotherapy of skin, head & neck, central and peripheral nervous system and GI tract tumors.

Paper IV : Principle and Practice of Radiathery of thoracic region, including breast, genito urinary system, lymphoretichlar system, musculo- skeletal system and padiatric tumors.

B. Clinical : 200 marks

One Long case - 80 marks

Three Short cases - 40 marks each

C. Viva Voice : 100 marks**1) Viva-Voce Examination: (80 Marks)**

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, for interpretation. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 Marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

D.

Maximum marks for M.D. degree course	Theory	Practical	Viva	Grand Total
	400	200	100	700

Recommended Books and Journals

Books

1. **The treatment of malignant disease by Radiotherapy** by Ralston Paterson 2nd edition, 1963
2. **Principles of Practice of Radiation Oncology** by Carlos A. Perez, Luther W. Brandy (Lippincott Raven)
3. **Textbook of Radiotherapy** by Gilbert H. Fletcher
4. **Moss Radiation Oncology** 7th Edition by James D. Cox, Mosby
5. **Cancer – Principles & Practice of Oncology** by Vincent T De Vita, Samuel Hellman Steven A. Rosenberg, 5th edition. (Lippincott – Raven)
6. **Recent advances in Clinical Oncology** by C.J. Williams & JMA Whitehouse
7. **Treatment of cancer** by Pat Price, Keith Halnan, 3rd edition.
8. **The Physics of Radiation Therapy**, 2nd Edition, Fiaz M. Khan, William and Wilkins
9. **Fundamental Physics of Radiology**, 3rd Edition, Meredith and Massey, Varghese
10. **Physics of Radiology** by H.E. John's & J.R. Cunningham, 4th edition.
11. **Clinical Oncology A multidisciplinary approach for Physicians and Students** Philip Rubin WB Saunders,
12. **Oxford Text Book of Oncology Volume – 1 and 2**, Peckham, Pinedo and Veronesi, Oxford,
13. **Clinical Oncology**, Abeloff, Armitage, Churchill and living stone,
14. **Basic Clinical Radio Biology** 2nd Edition, G. Gordon Steel Arnold
15. **Treatment planning in Radiation Oncology**, Khan, Roger A Portist William and Wilkins
16. **Radiation Therapy Physics** 2nd Edition Hende, Ibbott Mosby,
17. **Text Book of Radiation Oncology** Leible Philips, Saunders,
18. **Current Radiation Oncology**, Tobias / Thomas Arnold,
19. **Radiation Oncology Technology and Biology** Mauch / Loeffler Saunders,
20. **Paediatric Radiation Oncology** 2nd Edition, Halperin, Raven,
21. **Basic Science of Oncology**, Tannock, Hill Mc Graw Hill,
22. **Management of Head and Neck Cancer, Multidisciplinary approach** 2nd Edition Million J.B. Lippincott
23. **Principles of Radiological Physics**, Graham, Churchill Living Stone
24. **CANCER** 4th edition, Ackerman C.V. Mosby
25. **Radiobiology for the Radiologist**, Eric J. Hall, J.B. Lippincott

Journals

- **International Journal of Cancer**, UICC, Wiley Inc,
- **Genes Chromosomes and Cancer**, Wiley
- **Medical Physics**, American Association of Physicist in Medicines and Association of COMP

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- **Oral Oncology:** EJC Publications
 - **Seminars in Oncology** - W.B. Saunders Company,
 - **Seminars in Surgical Oncology** - UICC, Wiley Less
 - **Seminars in Radiation Oncology** – WB Saunders Company,
 - **Cancer Detection and prevention** – International Society for Preventive Oncology,
 - **ACTA Oncologica** – Scandinavian University Press,
 - **International Journal of Radiation Oncology, Biology, and Physics** – Elsevier
 - **Journal of Clinical Oncology** – Lippincott Williams and Wilkins
 - **Journal of Surgical Oncology** – UICC, Wiley
 - **Gynecologic Oncology** – Academic Press
 - **British Journal of Cancer** – Church Livingstone
 - **Current Opinion in Oncology** – Lippincott Williams and Wilkins, Rapid Series
 - **Journal of NCI** – Oxford University Press
 - **The Cancer Journal** – Jones and Bartlett
 - **International Journal of Cancer: Predictive Oncology** – UICC, Wiley less
 - **International Journal of Cancer : Radiation Oncology Investigations** – UICC, Wiley
 - **Endocurietherapy/Hyperthermia:** Advanced Medical Publishing,
 - **Radiotherapy and Oncology** – Elsevier.

Diploma in Radiotherapy (DMRT)

Goals

Radiotherapy is a clinical and scientific discipline devoted to management of patients with cancer and other disease by ionizing radiation, alone or combined with other modalities like Surgical Oncology and Medical Oncology. The clinical course requires training of professionals in the field .

At the end of the training program the candidate should have acquired sufficient expertise and in-depth knowledge in the field of Oncology, Basic and Radiological Physics, Radiobiology, Etiology, Pathology, Epidemiology and Statistics related to Malignant Diseases and the investigations commonly used like Radiology and Laboratory methods, Practice of Clinical Oncology with special Reference to Radiation Oncology and Chemotherapy, Management of Oncologic Emergencies and Side effects of Cancer Management. The candidate should have good knowledge of Cancer Prevention, early detection, rehabilitation and emotional problems.

They should be able to apply knowledge and skills at secondary and tertiary level of medical care.

The postgraduate training course would be to train a MBBS doctor who will:

- Practice efficiently and effectively specialty, backed by scientific knowledge and skill base; exercise empathy and a caring attitude and maintain high ethical standards; continue to evince keen interest in continuing education; and be a motivated and keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Demonstrate understanding of basic sciences relevant to this speciality
- Describe common malignancies in the country and their management including prevention

- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Update oneself by self study and by attending courses, conferences and seminars relevant to the speciality.
- Undertake audit, use information technology tools and, publish or present his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- Undertake complete patient monitoring including the care of the patient.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

A. Radiation Therapy Physics

Principles of Radiological Physics, Dosimetry, and Treatment Planning
Physics and Dosimetry of High & Low Dose-Rate Brachytherapy

General Physics

1. Matter and Energy, Radiation and Spectra,
2. Atoms and Nuclei,

3. Radioactivity,
4. Radioactivity – Materials,
5. The Production of X-Rays,
6. The Interaction of X- And Gamma Rays with Matter-I,
7. The Interaction of X-And Gamma Rays with Matter-II,
8. The Effects of X-Rays,
9. The Measurement of X-Ray Quantity,
10. The Roentgen and ITS Measurement,
11. The Geiger-Muller and Scintillation Counters and the Thermoluminescence Dosemeter,
12. Absorbed Dose and the Rad,
13. Filters and Filtration.

Physics Applied to Radiotherapy

1. The Physical Principles of Radiotherapy,
2. Teletherapy Dosage Data: General Considerations,
3. Teletherapy Dosage data for Clinical Use,
4. Out put Measurements and the use of Isodose charts,
5. Patients dosage,
6. Beam Modification,
7. Collimators and Beam-Direction Devices,
8. The treatment prescription,
9. Some special techniques,
10. Teletherapy Sources,
11. Acceptance tests and Calibration,
12. Gamma-Ray Sources for Plesiotherapy,
13. Plesiotherapy Dosage Calculations,
14. Particle Radiation in Radiotherapy.

Radiation Protection

1. General Principles and Materials,
2. Departmental Protection,
3. Protection Instruments and Personnel Monitoring.

B. Radiation Biology

- The Physics and Chemistry of Radiation Absorption
- DNA Strand Breaks and Chromosomal Aberrations
- Cell Survival Curves
- Dose-Response Relationships for Normal Tissues

- Model Tumor Systems
- Radiosensitivity and Cell Age in the Mitotic Cycle
- Repair of Radiation Damage and the Dose-Rate Effect.
- The oxygen Effect and Reoxygenation.
- Linear Energy Transfer and Relative Biological Effectiveness.
- Radiosensitizers and Bio-reductive Drugs.
- Radioprotectors.
- Cell, Tissue, and Tumor Kinetics.
- Time, Dose and Fractionation in Radiotherapy.
- New Radiation Modalities.
- Predictive Assays.
- Hyperthermia.
- Chemotherapeutic Agents From the perspective of the Radiation Biologist.
- Acute Effects of Total-Body Irradiation
- Radiation Carcinogenesis.
- Hereditary Effects of Radiation.
- Effects of Radiation on the Embryo and Fetus.
- Radiation Cataractogenesis.
- Molecular Techniques in Radiobiology.
- Diagnostic Radiology and Nuclear Medicine;
- Radiation Protection.

C. Basic Sciences

1. Pathology of Benign and Malignant Diseases

Principles and methods of definite diagnosis, Surgical biopsy, Exfoliative Cytology,

Fine needles aspiration cytology and biopsy

General histologic and cytological features of malignancy.

Classification of benign and malignant tumors and their interpretation.

Methods of dissemination of cancer and its biological behaviors.

Degree of differentiation of cancer.

Radiation pathology.

2. Applied Anatomy and Physiology.

Anatomy of oral cavity, larynx, pharynx, paranasal sinuses, CSF pathways, salivary glands, middle ear, external orbit, breast, bronchopulmonary segments, mediastinum, oesophagus, liver, spleen, small and large bowels, pelvic and genito-urinary organs (bladder, uterus, ovary, testis, rectum, anal canal etc).

3. Lymphatic system and drainage,

4. Relationship of vital structures,

5. General principles of physiology of respiratory, cardiovascular, nervous and biliary systems.
6. Various investigative and imaging Procedures in Diagnosis, Staging, Management and Follow-up of cancer.

D. Principles of Oncology

1. Molecular Biology of cancer: oncogene, Gytogenetics, The Cell Cycle, Invasion and Metastasis
2. Etiology of Cancer: Viruses, Chemical Factors, Physical Factors, Hormonal Factors
3. Epidemiology of Cancer:
4. Principles of Cancer Management: Molecular Pathology, Cancer Genetics,
5. Principles of Surgical Oncology
6. Principles of Chemotherapy
7. Principle of Biology Therapy,
8. Cancer Drug Discovery and Development, Mechanisms of Drug Resistance,
9. Clinical Trails in Cancer
10. Cancer Prevention: Preventing Tobacco – Related Cancers, Diet and Risk Reduction, Chemopreventive Agents, Hormones,
11. Cancer Screening,
12. Imaging Techniques in Cancer Management: Computed Tomography, Magnetic Resonance Imaging, Radionuclide Imaging, Ultrasound, Functional and Metabolic Imaging, Interventional Radiology, Endoscopy, Laparoscopy,
13. Vascular Access and Specialized Techniques of Drug Delivery
14. Paraneoplastic Syndromes
- 15.

E. Principles of Radiation Oncology

1. Biologic Basis of Radiation Therapy
2. Altered Fractionation Schedules
3. Morphology of Radiation Effects on Normal Tissues
4. Late Effects of Cancer Treatment: Radiation and Drug Toxicity
5. Staging and Classification of the Cancer and the Host: A Unified Approach versus Methodology of Clinical Trials
6. Chemical Modifiers of Radiation, Chemotherapy and Irradiation
7. Clinical Applications of Electron Beam Therapy
8. Total Body and Hemibody Irradiation
9. Three-Dimensional Conformal Radiation Therapy: Clinical Aspects
10. Particle Beam Radiation Therapy: Clinical Applications
11. Radio immunoglobulins in Cancer Therapy.
12. Radiotherapy – External/Brachytherapy: Indication, Rationale, Preparation of the Patient techniques, dose, volume, times, fractionation, Simulations, reduplication of treatment, Procedure, results, response, survival, complication, management of Radiotherapy complication follow-up and summary.

F. Practice of Radiotherapy and Multimodality Treatment

GROUP A:

Skin, Classic and Acquired Immunodeficiency Syndrome (AIDS)-Related Kaposi's Sarcoma, Cutaneous T-Cell Lymphoma, Brain, Pituitary, Spinal Canal, Eye, Ear, Nasopharynx, Nasal Cavity and Paranasal Sinuses, Salivary Glands, Oral Cavity, Tonsillar Fossa and Faucial Arch, Base of Tongue, Hypopharynx, Larynx, Unusual Nonepithelial Tumors of the Head and Neck, Head and Neck: Management of the Neck.

GROUP B:

Thyroid, Lung, Mediastinum and Trachea, Esophagus, Heart and Blood Vessels, Breast: Stage Tis, T1 and T2 Tumors, Breast: Locally Advanced (T3 and T4) and Recurrent Tumors, Pancreas and Hepatobiliary Tract, Colon and Rectum, Anal Canal, Kidney, Renal Pelvis, and Ureter, Bladder, Female Urethra, Prostate, Testis, Penis and Male Urethra,

GROUP C:

Uterine Cervix, Endometrium, Ovary, Fallopian Tube, Vagina, Vulva, Retroperitoneum, Adrenal Gland, Hodgkin's Disease, Non-Hodgkin's Lymphomas, Multiple Myeloma and Plasmacytomas, leukemias, Bone, Soft Tissue Sarcomas (Excluding Retroperitoneum, Pediatric Tumors: An Overview, Brain Tumors in Children, Wilms' Tumor, Neuroblastoma, Rhabdomyosarcoma, Lymphomas in Children, Radiation Treatment of Benign Disease, Pain Management, Supportive Care and quality of life in Radiation Oncology

GROUP D:

Oncologic Emergencies: Superior Vena Cava Syndrome, Spinal Cord Compression, Metabolic Emergencies, Surgical Emergencies, Urologic Emergencies,

Treatment of Metastatic Cancer: Brain, Lung, Liver, Bone, Malignant Pleural and Pericardial Effusions, Malignant Ascites

Infections in the Cancer Patients

Adverse Effects of Treatment: Nausea and vomiting, Oral complications, Cystitis, Pulmonary Toxicity, Cardiac Toxicity, Hair Loss, Gonadal Dysfunction, Second Cancers, Miscellaneous Toxicities,

Supportive Care and Quality of Life:

Management of Cancer Pain, Nutritional Support, Sexual Problems, Genetic Counseling,

Psychologic Issues, Specialized care of the Terminally ill, Approaches to Meeting the Needs of the Dying Patient, Rehabilitation of the Cancer Patient

Teaching / Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance. Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. *Lectures* : Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) *Didactic Lectures*: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library,
- 3) Medical code of Conduct and Medical Ethics
- 4) National Health and Disease Control Programmes
- 5) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) *Lectures by specialists* : In pathology, Radiation Physics, Radiobiology, Chemotherapy and Radiation Oncology.

c) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. *Journal Club* : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least three times a year and a total of six seminar presentations in two years. The presentations would be evaluated using check lists and would carry weightage for satisfactory completion of the course (See checklist in Chapter IV).

3. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least three times a year and a total of six seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for satisfactory completion of the course.

4. *Student Symposium*: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.
5. *Ward Rounds*: Ward rounds may be service or teaching rounds.
 - a) *Service Rounds*: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) *Teaching Rounds* : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries of (a) and (b) should be made in the Log book.
6. *Clinico-Pathological Conference*: Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
7. *Clinical case presentations*: Candidates should periodically present cases, which will be assessed by using check lists (see Chapter IV)
8. *Inter Departmental Meetings*: Strongly recommended particularly with departments of Medicine, Surgery, Orthopedics, etc., meetings should be attended by post graduate students and relevant entries must be made in the Log Book.
9. *Continuing Medical Education Programmes (CME)* : Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.
10. *Conferences*: Attending conferences is optional. However it is encouraged.

Graded Responsibility in Case of Patients and Operative work (Structured Training Schedule)

- I Year : Participation in OPD work, Observation in Treatment planning and execution and ward card helping the consultant in inpatient care.
- II Year: Participation in OPD, Treatment planning and execution under supervision of consultant & inpatient care.

Rotation Posting

The candidate shall be posted to other relevant departments or other Centers with better and latest equipments for a minimum period of 2 months for completion of training in Medical and Surgical Oncology and for Learning any Recent advances in the

Speciality. The student on completion of the training shall submit a report duly signed by the concerned department to the HOD Radiation Oncology.

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, and (iii) Clinical and operative skills.

i) *Personal Attitudes.* The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) *Acquisition of Knowledge :* The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Periodic tests:*

The departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The second test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book-* Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records:* Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

- Maintenance of Log Book for Academic Activities. All the Programs conducted should be entered in both the student and department records and countersigned by respective Teaching Faculty documenting the completion of assigned task.
- Record Books of Bed Side clinics, Seminars and Journals presented with Xerox copy of the presentation duly corrected and signed by a teacher with comments are to be maintained by the student and submitted to the Head of the Department periodically and at the end of the course.
- The Record books maintained by the student should be submitted to the Head of the Department 6 months prior to completion of the course and the Head of the Department makes a certification of the Academic Progress. An assessment of Student Performance through out the said course shall be made by the HOD and communicated to the University.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

i) *Theory:* 300 Marks

There shall be three question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I : Applied Anatomy, Pathology, Radiation Physics, Radio biology.

Paper II : General Principles of Radiotherapy & Cancer Chemotherapy

Paper III : Clinical Practice of Radiotherapy.

ii. *Clinical:* 150 marks

- One Long Case : 80 marks
- Short Cases – 2×35 marks = 70 marks

iii. *Viva voce* 50 marks

All examiners will conduct viva-voice conjointly on candidate's comprehension analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may also be given case reports, charts, gross specimens, Histo pathology slides, X-rays, ultrasound, CT scan images, Temporal bone dissection, etc., for interpretation and use of instruments will be asked.

iv.

Maximum marks for	Theory	Practical	Viva	Grand Total
DMRT	300	150	50	500

Recommended Books & Journals

Books

- **The treatment of malignant disease by Radiotherapy** by Ralston Paterson 2nd edition, 1963
- **Principles of Practice of Radiation Oncology** by Carlos A. Perez, Luther W Brandy (Lippincott – Raven)
- **Textbook of Radiotherapy** by Gilbert H. Fletcher
- **Moss Radiation Oncology** 7th Edition by James D. Cox, Mosby
- **Cancer – Principles & Practice of Oncology** by Vincent T De Vita, Samuel Hellman
- Steven A. Rosenberg, 5th edition, (Lippincott – Raven)
- **Recent advances in Clinical Oncology** by C.J. Williams & JMA Whitehouse
- **Treatment of cancer** by Pat Price, Keith Halnan, 3rd edition.
- **The Physics of Radiation Therapy**, 2nd Edition, Fiaz M. Khan, William and Wilkins
- **Fundamental Physics of Radiology**, 3rd Edition, Meredith and Massey, Varghese
- **Physics of Radiology** by H.E. John's & J.R. Cunningham, 4th edition.
- **Clinical Oncology A multidisciplinary approach for Physicians and Students**
- Philip Rubin WB Saunders,
- **Oxford Text Book of Oncology Volume – 1 and 2**, Peckham, Pinedo and Veronesi, Oxford,
- **Clinical Oncology**, Abeloff, Armitage, Churchill and living stone,
- **Basic Clinical Radio Biology**, 2nd Edition, G. Gordon Steel Arnold
- **Treatment planning in Radiation Oncology**, Khan, Roger A Portist William and Wilkins
- **Radiation Therapy Physics** 2nd Edition Hende, Ibbott Mosby,
- **Text Book of Radiation Oncology** Leible Phillips, Saunders,
- **Current Radiation Oncology**, Tobias / Thomas Arnold,
- **Radiation Oncology Technology and Biology** Mauch / Loeffler Saunders,
- **Paediatric Radiation Oncology** 2nd Edition, Halperin, Raven,

- **Basic Science of Oncology**, Tannock, Hill Mc Graw Hill,
- **Management of Head and Neck Cancer, Multidisciplinary approach 2nd Edition** Million J.B. Lippincott
- **Principles of Radiological Physics**, Graham, Churchill Living Stone
- **CANCER 4th edition**, Ackerman C.V. Mosby
- **Radiobiology for the Radiologist**, Eric j. Hall, J.B. Lippincott

Journals

- **International Journal of Cancer**, UICC, Wiley Inc,
- **Genes Chromosomes and Cancer**, Wiley
- **Medical Physics**, American Association of Physicist in Medicines and Association of Comp
- **Oral Oncology** : EJC Publications
- **Seminars in Oncology** – W.B. Saunders Company,
- **Seminars in Surgical Oncology** – UICC, Wiley Less
- **Seminars in Radiation Oncology** – WB Saunders Company,
- **Cancer Detection and prevention** – International Society for Preventive Oncology,
- **ACTA Oncologica** – Scandinavian University Press,
- **International Journal of Radiation Oncology, Biology, and Physics** – Elsevier
- **Journal of Clinical Oncology** – Lippincott Williams and Wilkins
- **Journal of Surgical Oncology** – UICC, Wiley
- **Gynecologic Oncology** – Academic Press
- **British Journal of Cancer** – Church Livingstone
- **Current Opinion in Oncology** – Lippincott Williams and Wilkins, Rapid Series
- **Journal of NCI** – Oxford University Press
- **The Cancer Journal** – Jones and Bartlett
- **International Journal of Cancer: Predictive Oncology** – UICC, Wiley less
- **International Journal of Cancer : Radiation Oncology Investigations** – UICC, Wiley less
- **Endocurietherapy/Hyperthermia** : Advanced Medical Publishing,
- **Radiotherapy and Oncology** – Elsevier.

Chapter III

Postgraduate Courses in Tuberculosis and Respiratory Medicine

M.D. in Tuberculosis and Respiratory Medicine

Goals

The postgraduate training course would be to train a MBBS doctor who will :

- Practice efficiently and effectively, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education in the speciality irrespective of whether he is in a teaching institution or is the speciality.
- Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion
- Describe common malignancies in the country and their management including prevention
- Demonstrate understanding of basic sciences relevant to this speciality
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Update oneself by self study and by attending courses, conferences and seminars relevant to the speciality.
- Teach and guide his team, colleagues and other students.

- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- Undertake complete patient monitoring including the care of the patient.
- To perform pulmonary function tests including Spirometry.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

Theory

- i) Basic Sciences including Anatomy, Physiology, Pathology, Microbiology and Pharmacology.
- ii) Arterial blood gases and acid base disturbance.
- iii) Tuberculosis – Pulmonary
Extra – Pulmonary and allied topics in Tuberculosis.
- iv) Non-Tubercular Respiratory Diseases.
 - a) Immunology of respiratory diseases.
 - b) Upper respiratory tract infection
 - c) Pneumonia
 - d) Emphysema
 - e) Lung abscess
 - f) Disease of Pleura

- g) Fungal infections of the lung
- h) Chronic bronchitis and emphysema
- i) Pulmonary hypertension
- j) Respiratory failure
- k) Bronchiectasis
- l) Parasitic diseases of the lung
- m) Sarcoidosis
- n) Bronchial asthma
- o) Pulmonary eosinophilia, PAN, Wegener's granulomatosis
- p) Pneumothrax and mediastinal emphysema
- q) Pulmonary thrombo embolism
- r) Occupational lung diseases
- s) Tumours of the lung
- t) Diffuse fibrosing alveolitis
- u) Respiratory manifestations of systemic diseases
- v) Hyaline Membrane Diseases, Cystic Fibrosis Goodpasture's syndrome
- w) Diseases of mediastinum
- x) Diseases of chest wall
- y) Diseases of diaphragm
- z) Lung transplantation

- v) Internal Medicine - basic level

Practical

- Pulmonary function test
- Spirometry
- ICD
- Pleural biopsy
- Arterial puncture
- FNAC
- Trucut lung biopsy

Teaching / Learning Activities

- | | | |
|----|--------------------------|-----------------|
| 1. | Clinical Case discussion | Twice a week. |
| 2. | Journal Club | Once a week |
| 3. | Subject Seminar | Once in 15 days |
| 4. | Mortality Meeting | Once a month |

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below. Depending on the facilities available, any or all of these methods may be employed. However, the activities for which details are given are mandatory.

1. *Lectures* : Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a) *Didactic Lectures*: Recommended for selected common topics for post graduate students of all specialties. Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library,
- 3) Research Methods
- 4) Medical code of Conduct and Medical Ethics
- 5) National Health and Disease Control Programmes
- 6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. *Journal Club* : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist in Chapter-IV). A time table with names of the student and the moderator should be announced at the beginning of every year.

3. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.

4. *Student Symposium*: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.

5. *Ward Rounds*: Ward rounds may be service or teaching rounds.
 - a) *Service Rounds*: Postgraduate students and Interns should do every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
 - b) *Teaching Rounds* : Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries of (a) and (b) should be made in the Log book.

6. *Clinico-Pathological Conference*: Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
7. *Inter Departmental Meetings*: Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of Surgery department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histo-chemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

8. *Microbiology*: Collection of specimen, AFB staining, Culture techniques and interpretation
9. Work in PFT laboratory
10. *Teaching Skills* : Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist by surgery faculty as well students. (See model checklist in Chapter IV). Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.

11. *Continuing Medical Education Programmes (CME)* : Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.

12. *Conferences*: Attending conferences is optional. However it is encouraged.

Rotation Postings

- | | | |
|------|---|------------|
| i) | In the parent department of TB and Respiratory Medicine | 26 months |
| ii) | Department of Medicine | - 6 months |
| iii) | Cardiology | - 1 month |
| iv) | Department of Radio-diagnosis | - 1 month |
| v) | Casualty and ICU (2 weeks each) | - 1 month |
| vi) | Cardio-Thoracic Surgery | - 1 month |

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) ***Clinical skills***

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a checklist (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) **Teaching skills** : Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) **Dissertation in the Department** : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) **Periodic tests**: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) **Work diary / Log Book**- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) **Records**: Records, logbooks and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The logbook is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Postgraduate student diary should include following activities.

Format for PG Diary (Log Book)

1. Cases seen on rounds – description of interesting cases and other miscellaneous topics discussed.
2. Outpatient cases seen and details of interesting cases with follow up.

3. Procedures done on inpatients and outpatients and consultation done.
4. Undergraduate teaching done during the day with details.
5. PG training programmes attended – details of bedside clinics, basic sciences, subject and clinical seminars, Journal clubs, mortality meet and hospital conference.
6. Night duties – details of patients managed and emergencies, consultation. Ward calls attended.
7. Details of study with topics covered during off hours in library / home. Periodicals and Journals reviewed with notes on interesting articles.
8. Medical meetings, Seminars, Local API / CSI meetings or other interesting CME, seminars attended.
9. Diary should be reviewed on weekly basis by unit faculty and certified on monthly basis for P.G.'s benefit at the end of each Medical/speciality rotation. Faculty should comment regarding absences and irregularities (Late arrivals and early departure) and make appropriate comments and suggest remedial measure for problematic prodigies.
10. *Size of note book:* 15 cm with 200 pages. All note books should have seal of college and H.O.D.s approval: Extra note books may be utilised as and when necessary. Diaries should be presented at the time of University clinical exam for review by examiners as per University regulations.

• **Procedure for defaulters:** Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Internal evaluation of P.G. Students performance during three years

I Year of M.D. Students

Assessment of students with multiple choice questions multiple short notes covering wide range of topics and practical examination with attention to history taking, clinical skills, relevant diagnostics and therapeutic plans ascertained. Suggested time of evaluation after first six months and at the end of first year rotation.

II Year of M.D. Students

Students should be evaluated at the end of II year on Theory and Practical examinations along with one faculty from General Medicine. For other specialities with short rotations of one month may evaluate the candidate for comprehension of the subject and clinical skills.

III Year of M.D. Students

P.G's should be evaluated at the beginning of his 3rd year training by panel of senior Postgraduate teachers. Suggested pattern of assessment with two essay type theory papers and multiple choice questions (200) – clinical skills, diagnostic and therapeutic skills evaluated intermittently by unit faculties.

Mock examination suggested – 3 to 4 months prior to final university exam should consist of two question papers each 3 hours duration, and Clinical and viva voce similar to university examination under the supervision of senior faculty.

Results of all evaluations should be entered into P.G's diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

Dissertation

1. Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
2. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
3. Every candidate shall submit to the Registrar (Academic) of RGUHS in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
4. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

5. The dissertation should be written under the following headings:
 - i. Introduction
 - ii. Aims or Objectives of study
 - iii. Review of Literature
 - iv. Material and Methods
 - v. Results
 - vi. Discussion
 - vii. Conclusion
 - viii. Summary
 - ix. References (Vancouver style)
 - x. Tables
 - xi. Annexures
6. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.
7. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.
8. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
9. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Scheme of Examination

Candidates will be allowed to appear for examination only if attendance (minimum 80%) and internal assessment are satisfactory and dissertation is accepted.

A. Theory (Written Papers) 400 marks

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I : Basic Sciences including Anatomy and Physiology pertaining to Respiratory System

Paper II : Non Tubercular Respiratory infectious Diseases and General Medicine

Paper III : Tuberculosis - Pulmonary and extra pulmonary

Paper IV : Non infectious diseases of lung

Note: The distribution of chapters / topics shown against the papers are suggestive only.

B. Clinical Examination: 200 marks

To elicit competence in clinical skills and to discuss differential diagnostic therapeutic aspects

One Long case – 100 marks

Two Short cases- 2 X 50 marks - one of the cases may be from General Medicine like Diabetes Mellitus, Cirrhosis, simple mitral stenosis etc.

C. Viva Voce Examination 100 marks

Aims to elicit candidates knowledge and investigative / therapeutic skills.

1) Viva-voce examination: (80 marks)

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be given case reports, charts, Spirometry, ABG, gross specimens, histo-pathology slides, x-rays, ultrasound, CT scan images, etc., for interpretation and questions on these as well as use of instruments will be asked. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

D. Maximum marks

Theory	Practical	Viva	Grand Total
400	200	100	700

Recommended Books

Name of the books	Name of the Author	Name of the Publication
1. Text Book on Tuberculosis Ed – 1972	K.N. Rao	Kotari Book Depot, Bombay
2. Respiratory Diseases Ed. 4 th	Crofton & Douglas	Blackwell Scientific
3. Pulmonary Diseases & Disorders III Ed. - 1998	I'ishman	McGraw Hill
4. Principles of internal medicine 14 th Ed. – 1998	Harrison	McGraw Hill
5. Chest Roentgenology 1995	Felson	W.B. Saunders Company U.S.A. & AITBS, India
6. Pulmonary Medicines Ist Ed. – 1995	D.Behera	Jaypee Brothers
7. Principles of Chest x-ray Diagnosis 4 th Ed. – 1990	George Simon	Butterworth & Jaypee Brothers
8. Tuberculosis Case finding and Chemotherapy	Toman. K	WHO, Geneva
9. Clinical Tuberculosis 2 nd Ed.	Davies P.D.	Chapman & Hall
10. Clinical Tuberculosis	Croften & Miller	W. B. Saunders
11. Tuberculosis and Non tuberculous Mycobacterial infections, 4 th ed.	Schlossberg	W. B. Saunders
12. Crofton & Douglas's Respiratory Diseases, 5 th Ed.	Seaton	Seaton & Leitch
13. Respiratory Diseases, 3 rd Ed.	Murray & Nadel	WB Saunders
14. Davidson's Principles and Practice of Medicine. 18 th Ed 1999,		Churchil Livingston

Journals

1. American Review of Respiratory Diseases	American Thoracic Society
2. Tubercle	British Thoracic & T.B. Association
3. Thorax	Thoracic Society British Medical Association
4. Chest	American College of Chest Physicians
5. Indian Journal of Chest Diseases & Allied Science	V.P. Chest Institute, Delhi.
6. Indian Journal of Tuberculosis	Tuberculosis Association of India

Diploma in Tuberculosis and Chest Diseases (DTCD)

Goals

The goals of the course would be to train a MBBS doctor who will:

- Practice efficiently and effectively backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education in the specialty
- Be a motivated 'teacher' – defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learner.

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2. Skills (Psycho motor domain)
3. *Human values, Ethical practice and Communication abilities*

Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common problems including emergencies, in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion
- Describe common malignancies in the country and their management including prevention
- Demonstrate understanding of basic sciences relevant to this specialty
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the proper specialist.
- Advise regarding the operative or non-operative management of the case and to carry out this management effectively.
- Update oneself by self study and by attending courses, conferences and seminars relevant to the specialty.
- Teach and guide his team, colleagues and other students.

- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations
- Undertake complete patient monitoring including the care of the patient.
- To perform pulmonary function tests including Spirometry.

Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
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 - f) Disease of Pleura

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- v) Hyaline membrane diseases, Cystic fibrosis, Goodpasture's syndrome
- w) Diseases of mediastinum
- x) Diseases of chest wall
- y) Diseases of diaphragm
- z) Lung transplantation

v) Internal Medicine - basic level

Practical

- Pulmonary function test
- Spirometry
- ICD
- Pleural biopsy
- Arterial puncture
- FNAC

Teaching / Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance. Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

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- 2) Use of library,
- 3) Medical code of Conduct and Medical Ethics
- 4) National Health and Disease Control Programmes
- 5) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b) *Integrated Lectures*: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. *Journal Club* : Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s), selected articles at least three times a year and a total of six seminar presentations in two years. The presentations would be evaluated using check lists and would carry weightage for satisfactory completion of the course (See Checklist in Chapter IV).

3. *Subject Seminar*: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics at least three times a year and a total of six seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for satisfactory completion of the course..

4. *Student Symposium*: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.

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7. *Clinical case presentations*: Candidates should periodically present cases, which will be assessed by using check lists (see Checklist in Chapter IV)
8. *Inter Departmental Meetings*: Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histo-chemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

9. *Continuing Medical Education Programmes (CME)* : Recommended that at least 2 state level CME programmes should be attended by each student in 3 years.
10. *Conferences*: Attending conferences is optional. However, it is encouraged.

Teaching programmes in the parent department

Each post graduate student should have completed journal club, subject seminar and clinical meetings – minimum of 6 each.

- | | | |
|----|--------------------------|-----------------|
| 1. | Clinical Case discussion | Twice a week. |
| 2. | Journal Club | Once a week |
| 3. | Subject Seminar | Once in 15 days |
| 4. | Mortality Meeting | Once a month |

Rotation Postings

- i) In the parent department of TB and Respiratory Medicine 18 months
- ii) Department of Medicine including Cardiology - 4 months
- iii) Department of Radio-diagnosis - 1 month
- iv) Casualty and ICU (2 weeks each) - 1 month

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include: (i) Personal Attitudes, (ii) Acquisition of Knowledge, and (iii) Clinical and operative skills.

i) **Personal Attitudes.** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) **Acquisition of Knowledge :** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation

skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Periodic tests:*

The departments may conduct two tests, one of them be at the end of first year and the other in the second year three months before the final examination. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) *Work diary / Log Book*- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records*: Records, logbooks and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training, Internal assessment should be based on the evaluation of the logbook.

Collectively, logbooks are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

A. Theory 300 marks

There shall be three question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100.

Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

I Paper : Basic Sciences including Anatomy and Physiology pertaining to respiratory System.

II Paper: Non Tubercular Respiratory Diseases

III Paper: Tuberculosis (Pulmonary and extra pulmonary)

Note: The distribution of chapters / topics shown against the papers are suggestive only.

B. Clinical 150 Marks

- i) One Long Case - 100 Marks
- ii) Two Short Cases - 25 + 25 Marks

C. Viva Voce: 50 Marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts,

Spirometry, ABG, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, etc., for interpretation.

D. Maximum Marks in DTCD

Theory	Practical	Viva	Grand Total
300	150	50	500

Recommended Books

Name of the books	Name of the Author	Name of the Publication
1. Text Book on Tuberculosis Ed – 1972	K.N. Rao	Kotari Book Depot, Bombay
2. Respiratory Diseases Ed. 4 th	Crofton & Douglas	Blackwell Scientific
3. Pulmonary Diseases & Disorders III Ed. - 1998	I'ishman	McGraw Hill
4. Principles of internal medicine 14 th Ed. – 1998	Harrison	McGraw Hill
5. Chest Roentgenology 1995	Felson	W.B. Saunders Company U.S.A. & AITBS, India
6. Pulmonary Medicines Ist Ed. – 1995	D.Behera	Jaypee Brothers
7. Principles of Chest x-ray Diagnosis 4 th Ed. – 1990	George Simon	Butterworth & Jeyppee Brothers
8. Tuberculosis Case finding and Chemotherapy	Toman. K	WHO, Geneva
9. Clinical Tuberculosis 2 nd Ed.	Davies P.D.	Chapman & Hall
10. Clinical Tuberculosis	Croften & Miller	W. B. Saunders
11. Tuberculosis and Non tuberculous Mycobacterial infections, 4 th ed.	Schlossberg	W. B. Saunders
12. Crofton & Douglas's Respiratory Diseases, 5 th Ed.	Seaton	Seaton & Leitch
13. Respiratory Diseases, 3 rd Ed.	Murray & Nadel	WB Saunders

14. Davidson's Principles and Practice of Medicine. 18 th Ed 1999,		Churchil Livingston
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JOURNALS

1. American Review of Respiratory Diseases	American Thoracic Society
2. Tubercle	British Thoracic & T.B. Association
3. Thorax	Thoracic Society British Medical Association
4. Chest	American College of Chest Physicians
5. Indian Journal of Chest Diseases & Allied Science	V.P. Chest Institute, Delhi.
6. Indian Journal of Tuberculosis	Tuberculosis Association of India

Chapter IV

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Model checklists are given in this chapter which may be copied and used.

The learning outcomes to be assessed should include: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, and (iv) Teaching skills.

i) **Personal Attitudes.** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trustworthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) **Acquisition of Knowledge :** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

iii) *Clinical skills*

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills :* Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

vi) *Periodic tests:* In case of degree courses of three years duration. The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. In case of diploma courses of two year duration, the departments may conduct two tests. One of them at the end of first year and the other in the second year three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) **Work diary / Log Book-** Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records:* Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

CHAPTER IV (Contd.)

Format of Model Check Lists

Check List -I. MODEL CHECK-LIST FOR EVALUATION OF JOURNAL REVIEW PRESENTATIONS

Name of the Student:

Name of the Faculty/Observer:

Date:

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Article chosen was					
2.	Extent of understanding of scope & objectives of the paper by the candidate					
3.	Whether cross references have been consulted					
4.	Whether other relevant publications consulted					
5.	Ability to respond to questions on the paper / subject					
6.	Audio-Visual aids used					
7.	Ability to defend the paper					
8.	Clarity of presentation					
9.	Any other observation					
	Total Score					

Check List – II
MODEL CHECK-LIST FOR EVALUATION OF SEMINAR
PRESENTATIONS

Name of the Student:

Name of the Faculty/Observer:

Date:

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Whether other relevant publications consulted					
2.	Whether cross references have been consulted					
3.	Completeness of Preparation					
4.	Clarity of Presentation					
5.	Understanding of subject					
6.	Ability to answer questions					
7.	Time scheduling					
8.	Appropriate use of Audio-Visual aids					
9.	Overall Performance					
10.	Any other observation					
	Total Score					

Check List - III

MODEL CHECK LIST FOR EVALUATION OF CLINICAL WORK IN WARD / OPD

(To be completed once a month by respective Unit Heads including posting in other departments)

Name of the Student:

Name of the Unit Head:

Date:

Sl. No.	Points to be considered:	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Regularity of attendance					
2.	Punctuality					
3.	Interaction with colleagues and supportive staff					
4.	Maintenance of case records					
5.	Presentation of cases during rounds					
6.	Investigations work up					
7.	Beside manners					
8.	Rapport with patients					
9.	Counseling patient's relatives for blood donation or Postmortem and Case follow up.					
10.	Over all quality of Ward work					
	Total Score					

Check List - IV

EVALUATION FORM FOR CLINICAL PRESENTATION

Name of the Student:

Name of the Faculty:

Date:

Sl. No.	Points to be considered	Poor 0	Below Average 1	Average 2	Above Average 3	Very Good 4
1.	Completeness of history					
2.	Whether all relevant points elicited					
3.	Clarity of Presentation					
4.	Logical order					
5.	Mentioned all positive and negative points of importance					
6.	Accuracy of general physical examination					
7.	Whether all physical signs elicited correctly					
8.	Whether any major signs missed or misinterpreted					
9.	Diagnosis: Whether it follows logically from history and findings					
10	Investigations required					
	▪ Complete list					
	▪ Relevant order					
	▪ Interpretation of investigations					
11.	Ability to react to questioning Whether it follows logically from history and findings					
12.	Ability to defend diagnosis					
13.	Ability to justify differential diagnosis					
14.	Others					
	Grand Total					

Check List - V

MODEL CHECK LIST FOR EVALUATION OF TEACHING SKILL PRACTICE

Sl. No.		Strong Point	Weak Point
1.	Communication of the purpose of the talk		
2.	Evokes audience interest in the subject		
3.	The introduction		
4.	The sequence of ideas		
5.	The use of practical examples and/or illustrations		
6.	Speaking style (enjoyable, monotonous, etc., specify)		
7.	Attempts audience participation		
8.	Summary of the main points at the end		
9.	Asks questions		
10.	Answers questions asked by the audience		
11.	Rapport of speaker with his audience		
12.	Effectiveness of the talk		
13.	Uses AV aids appropriately		

Check List - VI

MODEL CHECK LIST FOR DISSERTATION PRESENTATION

Name of the Student:

Name of the Faculty:

Date:

Sl. No.	Points to be considered	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Interest shown in selecting a topic					
2.	Appropriate review of literature					
3.	Discussion with guide & other faculty					
4.	Quality of Protocol					
5.	Preparation of proforma					
	Total Score					

Check List - VII

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE / CO-GUIDE

Name of the Student:

Name of the Faculty:

Date:

Sl. No.	Items for observation during presentations	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide/co-guide					
2.	Regular collection of case material					
3.	Depth of analysis / discussion					
4.	Departmental presentation of findings					
5.	Quality of final output					
6.	Others					
	Total Score					

Name: _____

Admission Year:

College:

[illegible]

LOG BOOK

Table 2 : Academic presentations made by the student

Name: _____ Admission Year: _____

College:

[illegible]

LOG BOOK

Table 3 : Diagnostic and Operative procedures performed

Name:

Admission Year:

College:

Date	Name	ID No.	Procedure	Category O, A, PA, PI*

* Key:

O - Washed up and observed

A - Assisted a more senior Surgeon

PA - Performed procedure under the direct supervision of a senior surgeon

PI - performed independently

Model Overall Assessment Sheet

Name of the College:

Academic Year:

Sl. No	Faculty Member & Others	Name of Student and Mean Score									
		A	B	C	D	E	F	G	H	I	J
1											
2											
3											
4											
5											
Total Score											

Note: Use separate sheet for each year.

ADDITIONAL READING

1. Indian Council of Medical Research, "Ethical Guidelines for Biomedical Research on Human Subjects", I.C.M.R, New Delhi, 2000.
2. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
3. Francis C M, Medical Ethics, J P Publications, Bangalore, 1993.
4. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
5. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8
6. Kirkwood B R, Essentials of Medical Statistics , 1st Ed., Oxford: Blackwell Scientific Publications 1988.
7. Mahajan B K; Methods in Bio statistics for medical students, 5th Ed. New Delhi, Jaypee Brothers Medical Publishers, 1989.
8. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, min. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi. P - 335.
9. National Health Policy, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983
10. Srinivasa D K etal. Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry

Chapter V

Medical Ethics Sensitisation and Practice

Introduction

There is now a shift from the traditional individual patient, doctor relationship, and medical care. With the advances in science and technology and the needs of patient, their families and the community, there is an increased concern with the health of society. There is a shift to greater accountability to the society. Doctors and health professionals are confronted with many ethical problems. It is, therefore necessary to be prepared to deal with these problems. To accomplish the Goal (i), General Objective (ii) stated in Chapter II (pages 2.1 to 2.3), and develop human values it is urged that *ethical sensitisation* be achieved by lectures or discussion on ethical issues, clinical case discussion of cases with an important ethical component and by including ethical aspects in discussion in all case presentation, bedside rounds and academic postgraduate programmes.

Course Contents

1. *Introduction to Medical Ethics*
 - What is Ethics
 - What are values and norms
 - Relationship between being ethical and human fulfillment
 - How to form a value system in one's personal and professional life
 - Heteronomous Ethics and Autonomous Ethics
 - Freedom and personal Responsibility
2. *Definition of Medical Ethics*
 - Difference between medical ethics and bio-ethics
 - Major Principles of Medical Ethics 0

Beneficence	=	fraternity
Justice	=	equality
Self determination (autonomy)	=	liberty
3. *Perspective of Medical Ethics*
 - The Hippocratic oath
 - The Declaration of Helsinki
 - The WHO Declaration of Geneva
 - International code of Medical Ethics (1993)
 - Medical Council of India Code of Ethics

4. *Ethics of the Individual*

The patient as a person
The Right to be respected
Truth and Confidentiality
The autonomy of decision
The concept of disease, health and healing
The Right to health
Ethics of Behaviour modification
The Physician – Patient relationship
Organ donation

5. *The Ethics of Human life*

What is human life
Criteria for distinguishing the human and the non-human
Reasons for respecting human life
The beginning of human life
Conception, contraception
Abortion
Prenatal sex-determination
In vitro fertilization (IVF), Artificial Insemination by Husband (AIH)
Artificial Insemination by Donor (AID),
Surrogate motherhood, Semern Intrafallopian Transfer (SIFT),
Gamete Intrafallopian Transfer (GIFT), Zygote Intrafallopian Transfer (ZIFT),
Genetic Engineering

6. *The Family and Society in Medical Ethics*

The Ethics of human sexuality
Family Planning perspectives
Prolongation of life
Advanced life directives – The Living Will
Euthanasia
Cancer and Terminal Care

7. *Profession Ethics*

Code of conduct
Contract and confidentiality
Charging of fees, Fee-splitting
Prescription of drugs
Over-investigating the patient
Low – Cost drugs, vitamins and tonics
Allocatison of resources in health cares
Malpractice and Negligence

-
8. *Research Ethics*
Animal and experimental research / humanness
Human experimentation
Human volunteer research – Informed Consent
Drug trials
9. *Ethical workshop of cases*
Gathering all scientific factors
Gathering all human factors
Gathering all value factors
Identifying areas of value – conflict, Setting of priorities,
Working out criteria towards decisions

Recommended Reading

Francis C.M., **Medical Ethics**, 1 Ed, 1993, Jaypee Brothers, New Delhi, p 189, Rs. 60/-

Notes

